

# World Transport Market and Logistics Project

KO1029 Barents Region Transport and Logistics

Report 15.5.2020



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# 1 Background and goals of the study

## BACKGROUND AND GOALS

The report examines the current state of different logistics and transportation flows in the Barents Region and creates understanding on the area's future competitiveness

### Barents Region is under a transformation

The rich natural resources of the Barents Region and growing tourism cause effects to the logistics chains and different material flows from and to the area. The fishing industry is developing and is moving towards the North and to new spheres. In addition to these changes, the Northeast passage offers a faster transportation route between Asia and Europe, that has big impacts on the development of the Barents Region. At the same time, the industries in the area face still the problem of reachability. Investments in mining-, energy production and fishery are not possible without good connectivity to different markets.

### Understanding the current situation is vital

In this report, the aim is to create an understanding of the current state of the different logistics, transportation and goods streams in the Barents Region in relation to the global market. In addition to that, the project aims at perceiving the future competitiveness of the area through futures scenarios.

In terms of the as-is analysis, all different ways of transportation in to and from the Barents Region, but also through the region. In the as-is analysis different changes in the operational environment affecting the region are also identified and analyzed.

In addition to the as-is analysis, futures scenarios are created in co-creation with the client to understand the possible state of the competitiveness of the area. The scenarios and overall findings of the report are presented in May.

## THE RESEARCH QUESTIONS OF THE REPORT ARE

Phase 1: AS-IS analysis	Phase 2: Future scenarios
<ol style="list-style-type: none"><li>1. What kinds of different goods-, cargo- and tourism flows are moving in the Barents Region at the moment?</li><li>2. What are the directions, quantities, routes and special features they entail in relation to the global market?</li><li>3. What kinds of changes in the operational environment impact the streams?</li></ol>	<ol style="list-style-type: none"><li>1. What is the competitiveness of the Barents Region in the Global market in 2030 and 2040?</li><li>2. What kinds of alternative development paths can be seen in terms of the changes in the operational environment?</li><li>3. What other, emerging changes might occur in the operational environment that affect the Barents Region?</li></ol>

## 2 The implementers' recommendations and conclusions

## CONCLUSIONS AND RECOMMENDATIONS

The Barents Region has great potential to being competitive in the global logistics and transportation market in the future, yet COVID-19 has made forecasting more challenging

### THE KEY CONCLUSIONS OF THE PROJECT

#### *BARENTS IS FULL OF RICH RESOURCES AND BUSINESSES*

The Barents Region is the area of industries, huge investment potential, growing logistics corridors and sensible nature and cultures. There are a lot of mineral and energy sources and investments in industrial value chains including supporting transport systems.

#### *A MORE CONSISTENT REGION REQUIRES CROSS-BORDER INFRASTRUCTURE*

Border crossing transport flows and infrastructure analysis is a key in creating consistent Barents Region from logistics market point of view.

#### *SUSTAINABILITY NEEDS TO BE THE GUIDING PRINCIPLE TO SECURE THE ARCTIC*

Sustainability must be integrated in business processes especially in the Barents Region to meet challenging demands of the sensible Arctic area.

#### *OIL AND GAS ARE DECREASING IN SIGNIFICANCE*

The future Arctic strategies are not focused on growing oil and gas productions, instead focus areas are in green technologies, blue economy, sustainable industrial refining chains and utilization of nature and climate in tourism business.

#### *DIGITAL WILL DOMINATE*

Digitalization will increase its significance in the future. It's not a new phenomena, but it will strengthen very fast. It includes business models, investments in diverse scales and huge potential for future development. It's also tool to decrease accessibility challenges of peripheral areas.

### OUR RECOMMENDATIONS

*THE KEY SUCCESS FACTORS IN THE BARENTS REGION ARE:*

- **Maintenance and development of the present transport infrastructure**
- **Utilization of cross-border approaches – internationality is in the DNA**
- **Development of accessibility and digital traffic in northern circumstances**

*Increased transport volumes in the Northern Sea Route and container train transports between Europe and Asia has future potential and are important to follow and to be connected.*

For future analysis, **data base of transport volumes in all the transport modes in the Barents Region would be valuable and useful for all the development plans and projects.** Now transport flows must be collected and estimated from different data sources and these are not necessarily commensurable. Therefore this could be regularly and systematically collected (compared to investment potential analysis by Arctic Business Forum in yearly basis).

#### **COVID-19 PANDEMIC HAS MADE FORECASTING FUTURE DEVELOPMENT CHALLENGING**

*What kind of business environment and structure we have after the lockdown. Many things are going to be changed. Is there more protectionism, what is the vitality of the companies in the region, what kind of investment possibilities are in public funding etc. Also geopolitics play also a key role, how e.g. the main trading partners change. Stability and border crossing co-operation has been long-term principles in the area. the analyses were conducted in Jan-Feb 2020 before the Covid-19 had hit the market and hence some of the conclusions and predictions might be outdated.*

## RECOMMENDATIONS TO FUTURE PILOTS

During the study, a concrete opportunity for a next step pilot in the Barents Region rose - feeds from and integrates the future scenarios and trends



### INTELLIGENT CROSS-BORDER FREIGHT to increase competitiveness



Both automation and green transport bring larger vehicles to roads, either in the shape of platooning or high capacity transportation (HCT). In terms of HCT measurements, the legislation and premises differ considerably country-to-country. With platooning, the narrow 2-line roads are a challenge. However, as there are already significant shortage of heavy transport drivers, the heavy industries of Barents Region are growing and demands for climate actions increase, the demand for both solutions is likely to further increase.

Intelligent transport systems have several dimensions to freight transport system including positioning, 5G, and intelligent infrastructure development. Pilots of automatization already take place in industrial plants and mines (closed areas) in the Barents region and will increase. In addition, E-custom procedures and e-consignment note systems enable seamless and paperless transport chains. This allows more effective and fluent operating border crossing supply chains, for example CAAS – Corridor as a Service concept.

**VISION**

Create a full opportunity for companies to combine transport and cut transportation costs in an area where operators are already striving for the largest possible transport sizes due to long distances.

To support, an intelligent transport corridor concept in the cross-border Barents logistics which allows in certain crucial road transportation routes seamless operation. E.g. an app showing the routes allowed for large vehicles and handling e-custom procedures.

Piloting and study work implemented in cooperation with logistics companies.

- THINGS TO SOLVE IN THE PILOT**
1. Based on the scenarios of 2030-2040, further study the targets for HCT and platooning, where largest future possibilities for business, cutting emissions and costs exist
  2. Find out the routes where piloting would be possible
  3. Map out the limitations – e.g. legislation, winter tire regulation, allowed measurements and masses, infrastructural limitations
  4. Create the concept of solutions: Infrastructure development, e-service solutions, administrative development points
  5. Evaluate the effectiveness and environmental, cost and business development related effects of pilot.

# **3 Barents Region as a transportation and logistics operating environment today**



Federal plans for transport infrastructure development

Regional development plans and strategies

UN Sustainable Development Goals

Smart specialization strategies

*EU Projects in the area:*  
 Northern Periphery Programme  
 The Baltic Sea Programme  
 Kolarctic ENPI

Other joint Barents Region plans and agreements

Arctic strategies in EU and diverse countries

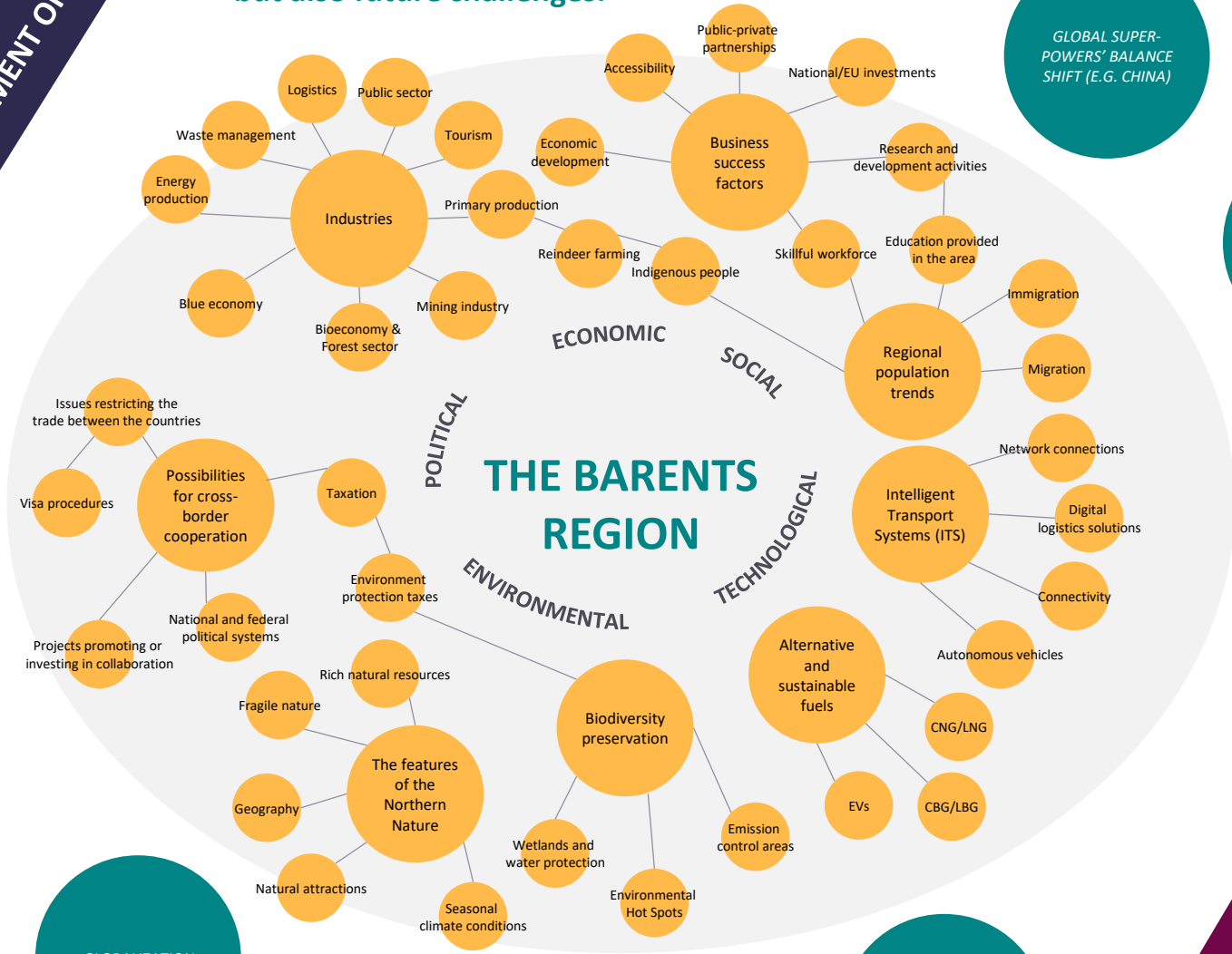
Environmental commitments

**PROJECTS AND PLANS INFLUENCING THE FUTURE DEVELOPMENT OF THE AREA**

**GLOBAL MEGATRENDS AND DRIVERS**

MEGATREND

**” The Barents Region has many resources to gain a competitive advantage in the world market – but also future challenges.**



**EMERGING SIGNALS**

- Flight shame
- Arctic shipping boycott
- E-commerce
- 3D-printing
- E-visa
- Russian waste crisis
- Online & remote meetings

**URBANIZATION**

**DIGITIZATION**

**THE CURRENT STATE OF THE INFRASTRUCTURE**

- Port capacity
- Flight connections
- Arctic railway projects
- Goods storage facilities
- Railway electrification rate
- HCT (Threshold values for vehicles)
- Northeast passage /Northern sea route
- Different rail gauges in SWE+NOR vs FIN+RUS
- Cable infrastructure (e.g. Arctic Connect data cable)

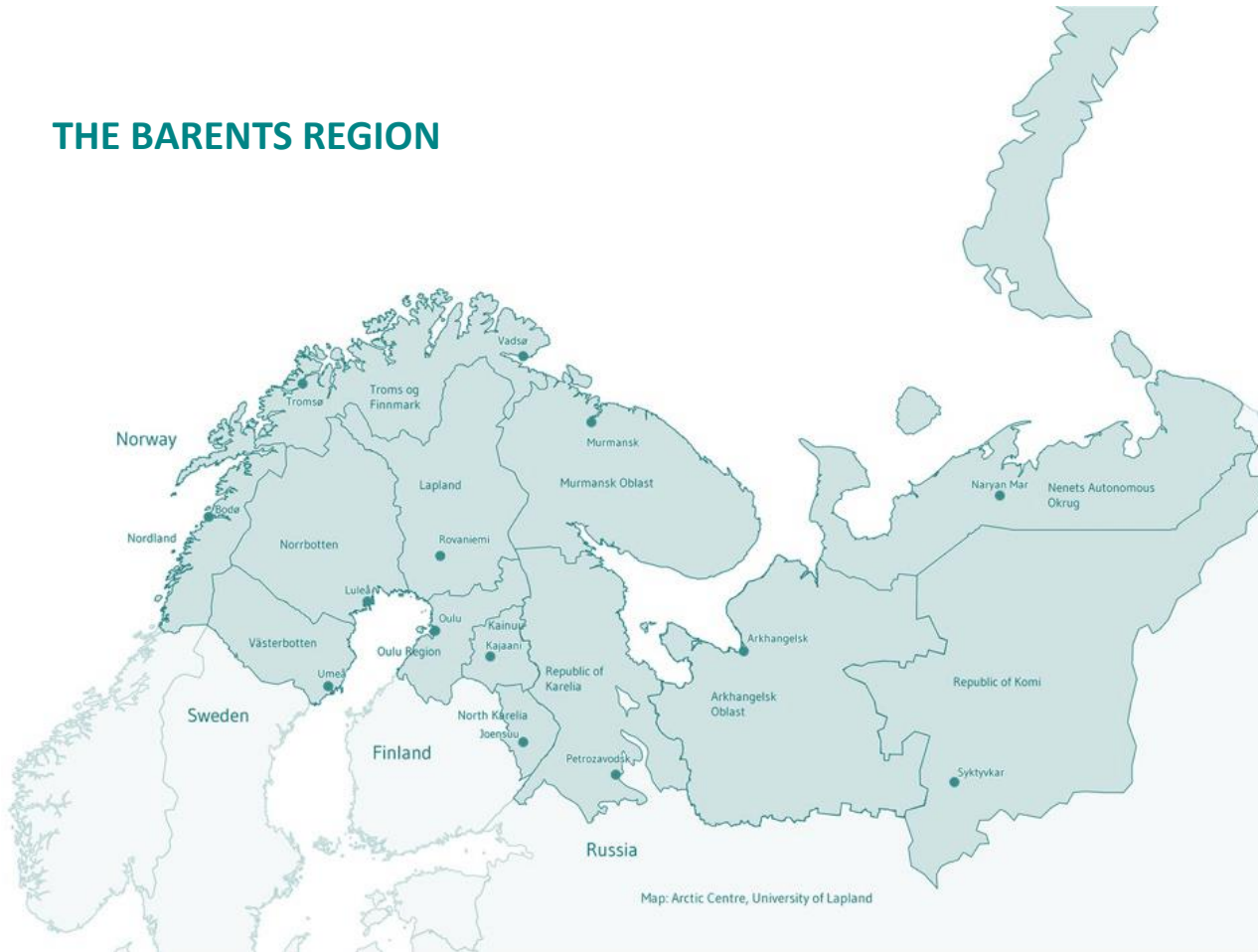


## 3.1 Key characteristics of the industries and transportation infrastructure in the region

## KEY CHARACTERISTICS

Multiple special characteristics in the Barents Region affect the transportation sector significantly

## THE BARENTS REGION



### LARGE GEOGRAPHICAL AREA

Approx. 5,3 million inhabitants, density of population 3,5 inhabitants/km<sup>2</sup> (0,3-8)

### DOMINATING INDUSTRIES

Industrial structure is dominated by mining and metal industries, petroleum and gas industries, forest industries, and seafood and marine resources.

### BIG INVESTMENTS

A lot of huge investment project ongoing and transport volumes are strongly increasing.

### FRAGILE ENVIRONMENT

Very sensitive area both in terms of nature and culture basis.

## KEY CHARACTERISTICS

Overview on transport infrastructure and main transport flows in the Barents Region.

**Road transports dominates** as a transport mode in the Barents Region and **accessibility is mainly based on road transports both in passengers and freight in regional and cross-border transports.**

Sea transports are main transport as an industrial transport mode mainly focused on NSR. Also in connectivity between the Barents Region and other markets rail transports play a certain role and in passenger transports also air transport are vital for the Region.

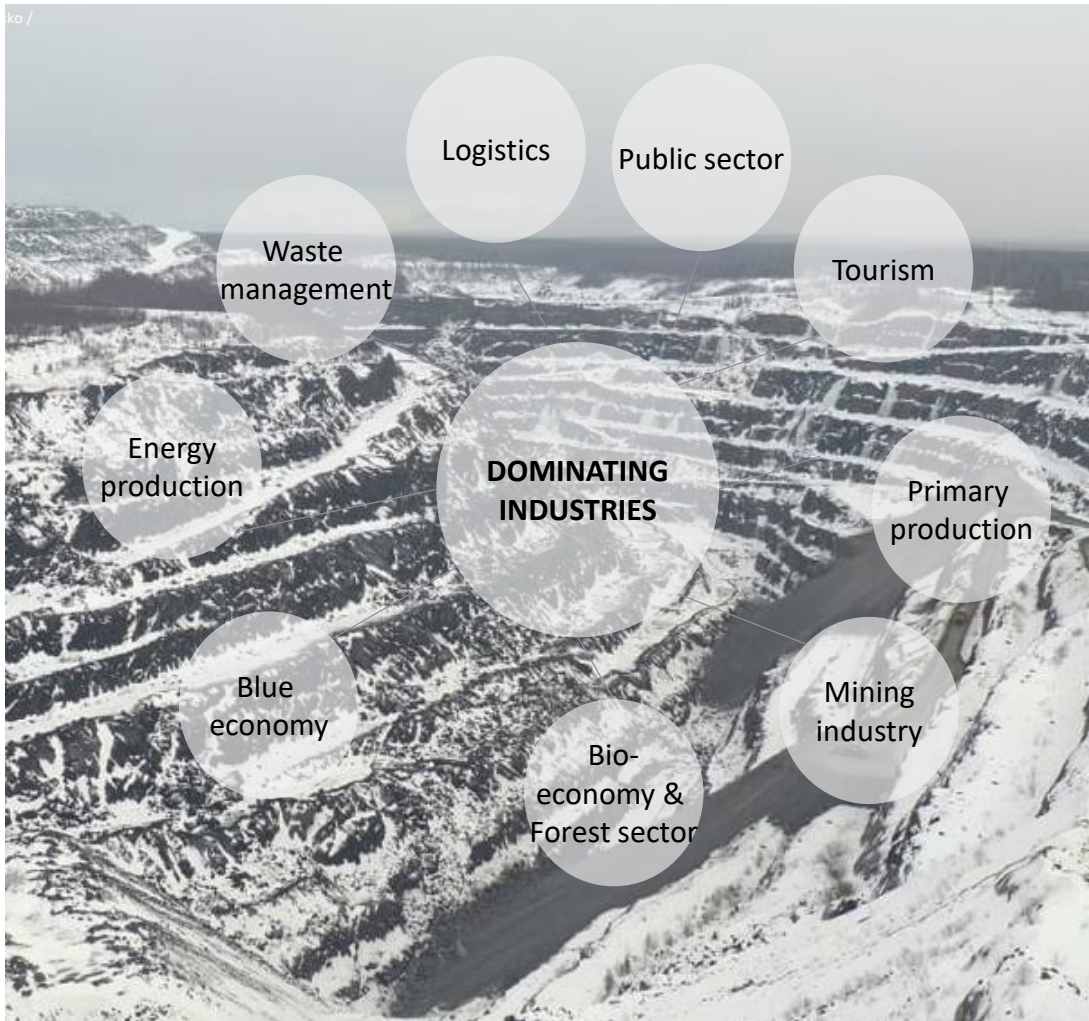
There are **a few very high-volume transport corridors in rail transports**, for example in Russia related to Kola peninsula and Murmansk sea port and also “mine railway” from Kiruna to Narvik with extension to Luleå sea port. Main product group in these transport corridors is mining products.

From transportations point of view there are **a lot of transport flows east-west direction in cross-border transport chains.** At national level transport infrastructure and system is based on southbound transport connections in each country. Therefore we need the change of paradigm to highlight the importance of transport connections to all directions.

**Arctic areas are the most potential sources of natural resources including energy.** But there are increasing amount of process industries and value added chains. Therefore we can't see the Arctic only as a source of resources, it's also very potential business area of diverse industries and logistics.

## KEY CHARACTERISTICS

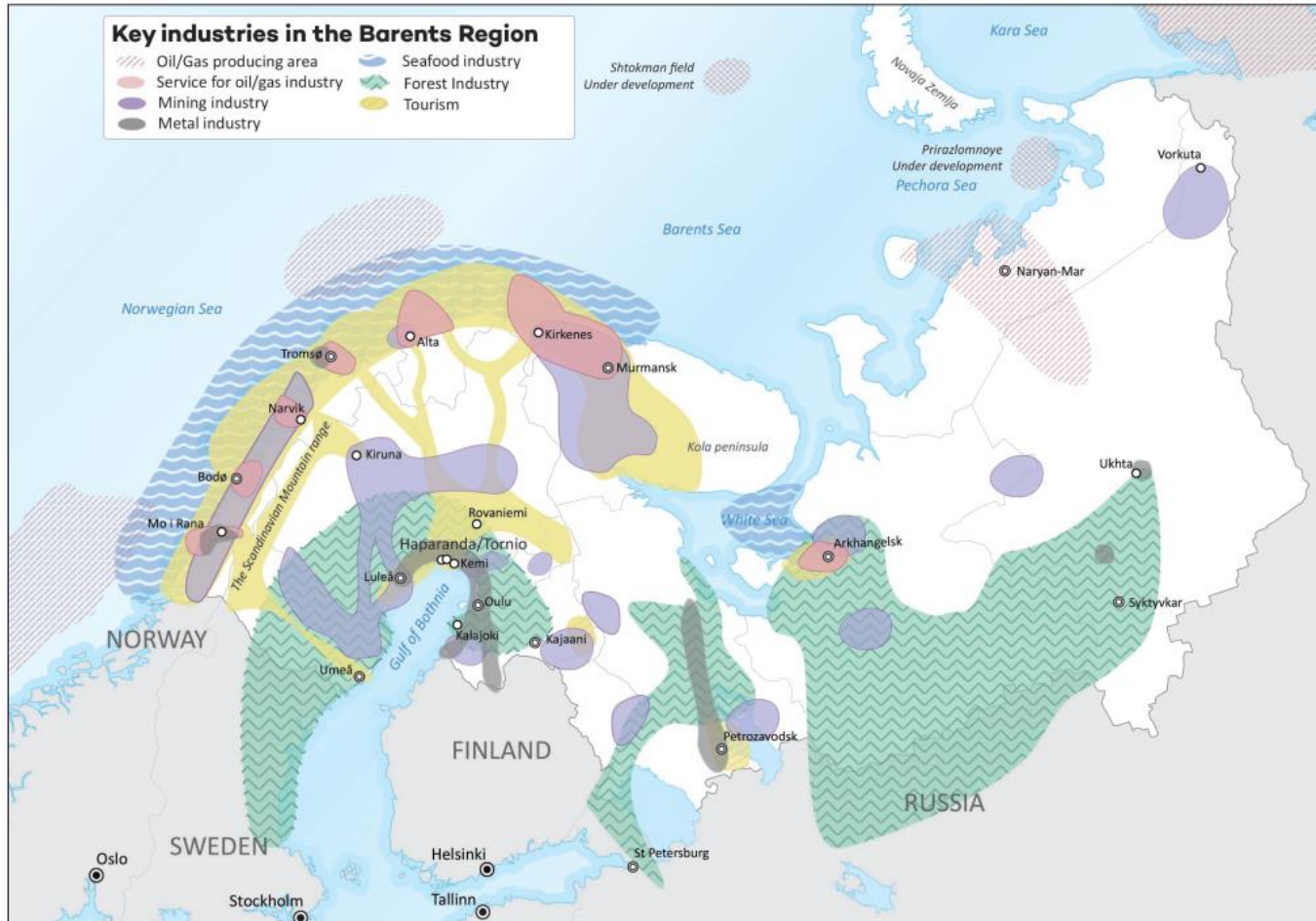
The main industries in the Barents Region are linked to the rich resources in the area – or supplementing them – many



- Industries in the Barents Region relates a lot in usage of natural resources. **Mining** is one key business area in the Region and there are also located diverse refining chains. There are also modernization of refining chains under construction and a lot of new invests also focus on the Arctic. **Energy production** is another growing business area in form of oil and gas, but also there are a huge investments to renewable energy production, eg. wind power. The third main focus area is **blue economy** including all the seafood and marine resources. The fourth main business area is **forest industries**, which is mainly focused on bioindustries in the future, but also in mechanical forest industries.
- The Barents Region can be seen as a “resource bank”, where 17 % of all the known mineral resources, 25 % of oil and gas resources in the world are located in the area. Forests in the Europe are located by 70 % and fishing industries by 50 % in the Barents Region. Therefore the potential is huge.
- **Logistics** as a business area is very significant both from the accessibility point of view and also as a growing industry itself. Logistics is a precondition for all the industries to operate in the region and to connect raw materials and products to the markets. Logistics is a backbone of value-added chains of diverse industries.
- Arctic nature is very sensitive and therefore in planning operations models in diverse industries nature values has to be taken into account. Same thing relates to cultural approaches.

## KEY CHARACTERISTICS

Diverse areas have different industrial strengths and growth potential

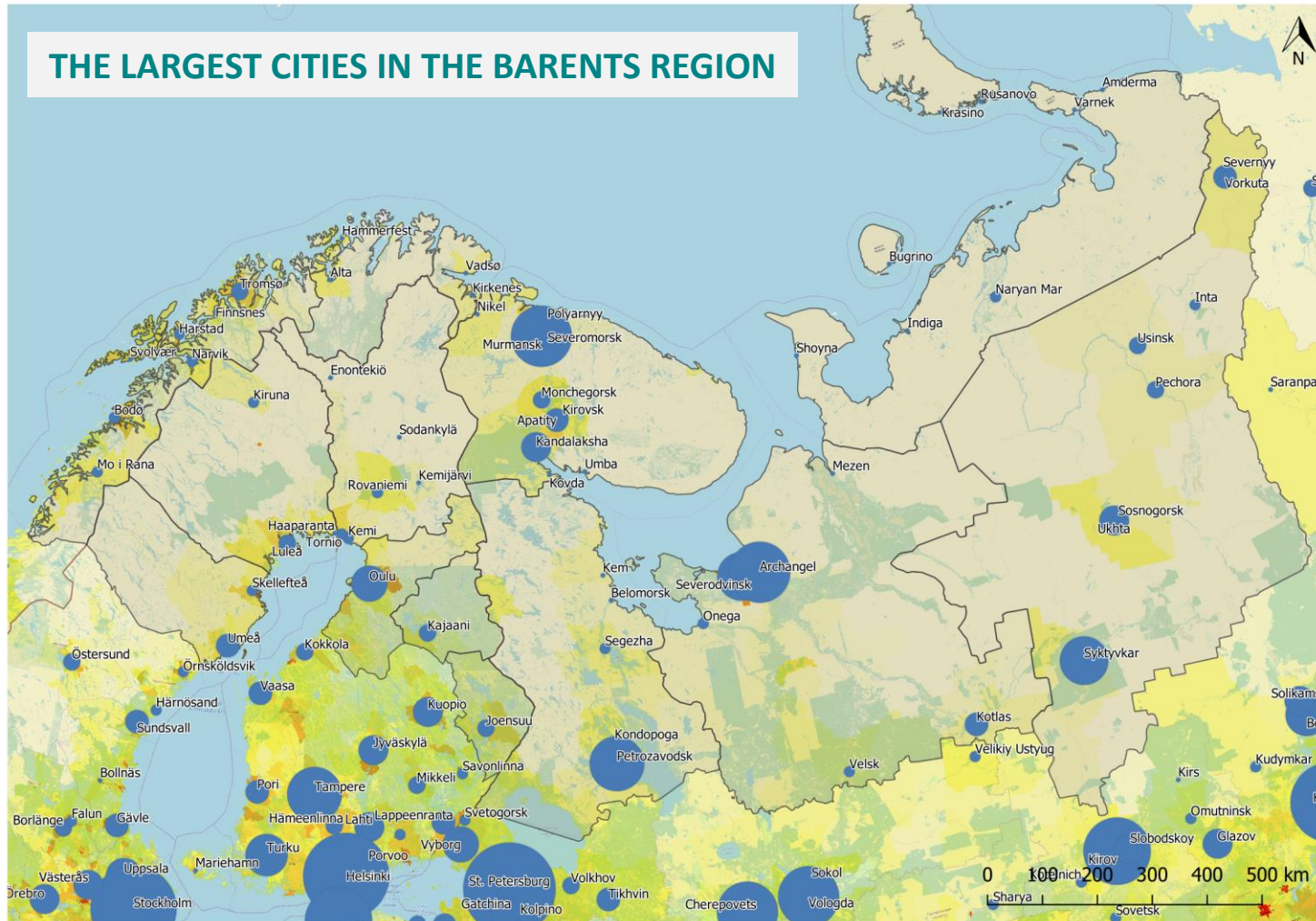


**BIOINDUSTRY, SEAFOOD, MINING AND ENERGY PRODUCTION ARE THE MOST GROWING BUSINESS AREAS.**

Also logistics as a industry is a growing business area due to these industrial investments and also increasing usage of NSR transport route. There are increasing amount of freight cargo transported in the area and it requires new facilities in sea ports, cargo handling and vessels.

## KEY CHARACTERISTICS

The largest cities in the region are located in Russia, Oulu is the biggest in Scandinavia



The biggest cities are located in Russia. **Archangel, Murmansk, Syktyvkar** and **Pedrozavodsk** have highest population in this area, and these are all industrial cities.

**Oulu** is the biggest city in Scandinavia with very versatile business base. high technology businesses are characteristic for Oulu region.

**DENSITY OF POPULATION 3,5 INHABITANTS/KM<sup>2</sup>, VARIATION IN DENSITY 0,3-8 INHABITANTS/KM<sup>2</sup>.**



## 3.2 Policies and plans affecting the future of Barents Region



# Arctic strategies of the member states in the Barents Region



Norway's Arctic Strategy (2017) and Norway's Arctic Policy (2014), where both strategies are quite similar in content, but 2017 version is updated to more present situation.

This strategy determines priority areas, which are: International cooperation, business development, knowledge development, infrastructure, and environmental protection and emergency preparedness.

Norway has been the first state in the world, which launched the Arctic Strategy. It was published in 2006.



Sweden's Strategy for the Arctic Region (2011), which presents Sweden's relationship to the Arctic. The priorities relates to climate and environment, economic development and human dimension. Sweden published also the New Swedish Environmental Policy for the Arctic (2016) to show the state's continued interest in the Arctic Region.

Sweden has also announced to renew its Arctic Strategy.



Finland's Strategy for the Arctic Region (2010 and 2013), where the first strategy mainly focused on external relations in the Arctic Region. The next strategy focused in addition to external relations also to creation of business opportunities.

Action Plan for the Update of the Arctic Strategy (2017), where four focus areas were presented. These are Arctic policies in foreign affairs and EU, Arctic knowledge based businesses, sustainable tourism, and infrastructure development.

New Arctic Strategy will be released in 2020.



Strategy for the Arctic Development of the Arctic Zone of the Russian Federation and National Security Efforts for the Period up to 2020 (2008 and 2013), where 2013 version was an update from 2008 version. It identifies five main priorities: integrated socio-economic development of the Arctic zone, the development of science and technology, the establishment of modern information and telecommunications infrastructure, environmental security, international cooperation in the Arctic, and provision of military security and protection. Also ministries, for example Ministry of Natural Resources has published strategies and plans for resource utilisation of the Arctic.

Russia published in 2020 new policy of basic principles for the Arctic in next 15 years: Basic Principles of Russian Federation State Policy in the Arctic to 2035. Main approach remains the same as in the previous arctic policy, that the Arctic is the main resource base for the Russian's economic growth. From transportations perspective, it emphasize developing Northern Sea Route (NSR) a globally competitive national transport corridor.



Joint Communication on an integrated EU policy for the Arctic (2016), which mainly highlighted EU's strategic interest in playing a key role in the Arctic area. Priority areas were climate change and safeguarding the Arctic environment, sustainable development in and around the Arctic, and international cooperation on Arctic issues. Former EU Commission published Arctic Policy (2019), which is an updated version of former Arctic policy.

## POLICIES AND PLANS

### Diverse policies regarding the Arctic

#### **POLAR CODE**

International Code for Ships Operating in Polar Waters (IMO) entered into force on 2017. Polar Code is mandatory under both the International Convention for the Safety of Life at Sea (SOLAS) and the International Convention for the Prevention of Pollution from Ships (MARPOL). It covers the full range of design, construction, equipment, operational, training, search and rescue and environmental protection matters relevant to ships operating in the inhospitable waters surrounding both the North Pole and the South Pole. Polar Code is an example of regulations, which are set in global environment. In addition, there are regulative work done in the Arctic Council and its member states. All these regulations should be consistent with the provisions of the United Nations Convention on the Law of the Sea (UNCLOS).

#### **THE ARCTIC INVESTMENT PROTOCOL**

World Economic Forum Global Agenda Council on the Arctic published in 2015 the code of conduct to balance a diverse and rapidly changing business areas, sensitive nature and emerging global investment potential in a sustainable way. It covers following principles: build resilient societies through economic development, respect and include local communities and indigenous people, pursue measures to protect the environment of the Arctic, practice responsible and transparent business methods, consult and integrate science and traditional ecological knowledge, and strengthen pan-Arctic collaboration and sharing of best practices.

**BLUE BUSINESS, GREEN FUTURE** approach is relevant in the Arctic areas highlighting responsible and sustainable operations and businesses in the area. It's not a policy, but common mindset and target related to development of the Arctic. The Arctic is not an consistent area, it's a combination of diverse areas in different development phases and targets with focus on various investments, utilization of resources and logistics issues.

#### **GEOSTRATEGIC RELEVANCE**

of the Arctic Region is by analysis of security and international cooperation approaches one important aspect in evaluation of operations environment in the Arctic. FIIA briefing paper April 2019/259 comes to the conclusion that although the security environment in Northern Europe has deteriorated, international cooperation has continued relatively well in the Arctic. Stability is one key feature in the Arctic. However, it is also a region of strategic competition and changes in the broader geostrategic situation have also concretized in the European Arctic and the Arctic is back on the geopolitical map. Increasing global and especially Chinese interest towards the region and the effects of climate change making this area more accessible for human activities will increase significantly the geostrategic relevance of the Arctic region in the future. China published its first Arctic Strategy on January 2018 and also Belt and Road Initiative is an example of China's interests to the Arctic and China has renamed the Arctic shipping route as a Polar Silk Route.

#### **SUSTAINABILITY**

is mainly included in business solutions and processes. This development and change of mindset is visible in all the countries in the Barents Region. There are for example green mining programs, circular economics focus, and social, cultural and environmental sustainability focus.

## POLICIES AND PLANS

The biggest investment potential is seen in mines, oil and gas, energy production and transport infrastructure

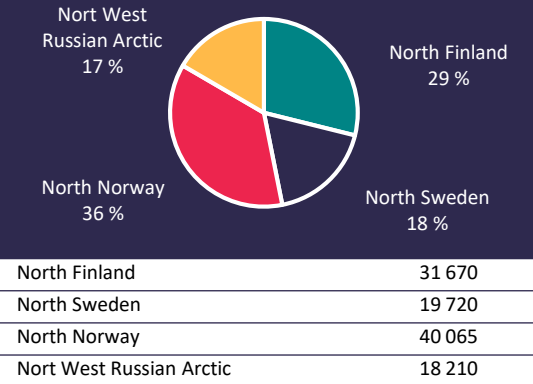
### INVESTMENT POTENTIAL

- Lapland Chamber of Commerce has published estimations about investment potential in the European High North area in the Arctic Business Forum, which is yearly based organized Arctic forum in Finnish Lapland.
- It's estimated to be about 110 billion euros by the year 2030, which means that European High North as an arctic area is a very potential business area during the next decade.
- The biggest investments relates to industrial value chains from mines through industrial processes to markets, oil and gas, energy production and transport infrastructure. Thus the industrial structures are going to strengthen in the Arctic area.
- After financial crisis in 2008 it has been difficult to estimate realisation and time span of investment projects due to fluctuations in price levels of oil, gas and mining products, and also climate change issues, which affects the discussion and decision making related to fossil fuels and forestry industries. Thus in addition to financial arrangements, environmental topics through political discussion has risen in key focus.

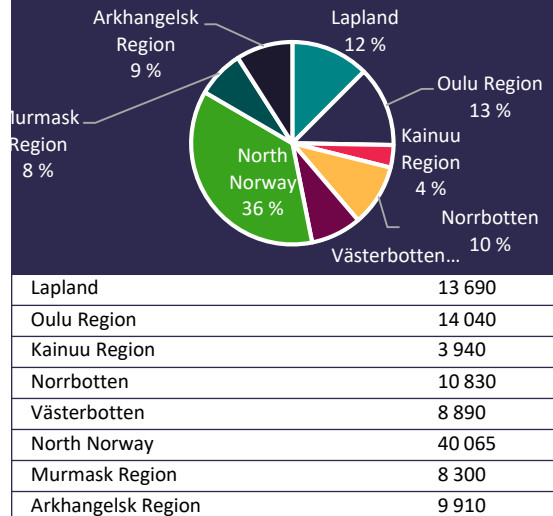
**109 665 M€**

**TOTAL EUROPEAN HIGH NORTH INVESTMENTS UP TO 2030**

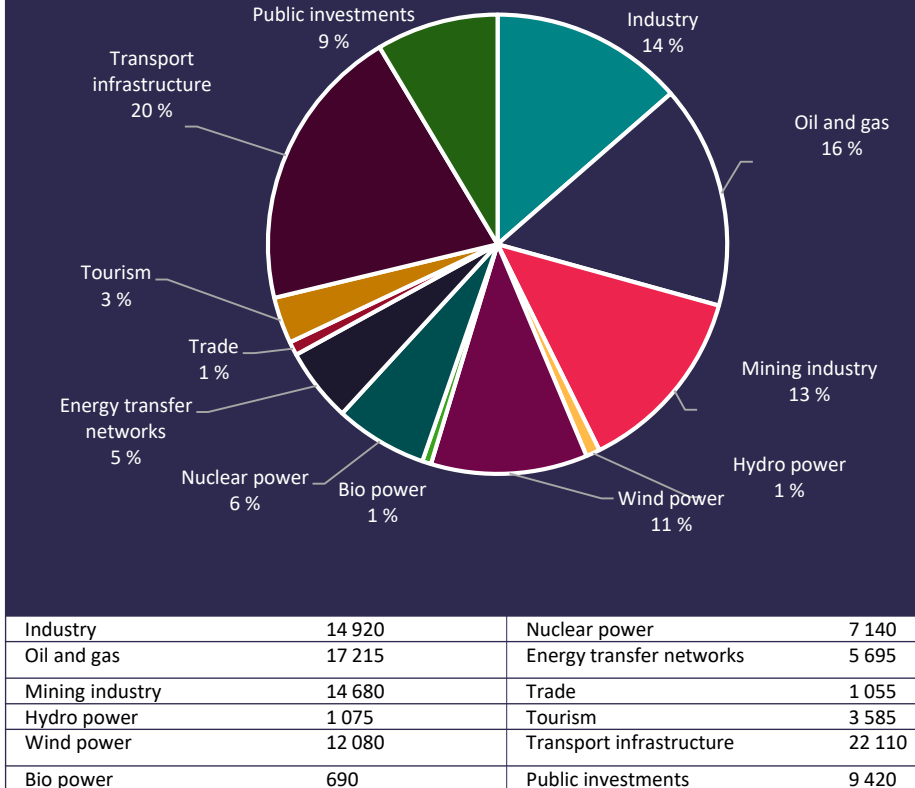
EHN INVESTMENTS UP TO 2030 – COUNTRIES (M€)



EHN INVESTMENTS UP TO 2030 – REGIONS (M€)



EHN INVESTMENTS UP TO 2030 – BY BRANCHES OF BUSINESS (M€)





- Commitment to CO2 emission decrease target for Norway is 40 % by 2030 (compared to 1990 level).
- The Norwegian climate strategy for 2030 includes a commitment to CO2 emission decrease 35-40 % by 2030 (compared to 2005 level).
- Carbon neutral society in 2050 → also emission-free transport system by 2050.



- In line with EU targets.
- In 2017 Climate law: not net contributor in CO2 emissions by 2045 and after that negative emissions. Also reduction of CO2 emissions by 70 % by 2030 (compared to 2010 level).
- In addition to fuel solutions, Swedish strategy relates also to community planning and transport planning. A transport efficient society is one approach to fulfil challenging environmental targets.



- Commitment to CO2 emission decrease target for Finland is 60 % by 2030 (compared to 1990 level).
- Carbon free transport system in Finland in 2045, CO2 -50 % by 2030 (compared to 2005 level).
- The growth of private passenger car traffic ends in 2025.
- Amount of biofuels 30 % in 2030 and 100 % in 2045.



- Russia has an action plan for adaptation of climate change and ratification of Paris climate agreement. Not clear policy for emission decrease commitments regarding transport sector.
- General goal is to reduce CO2 emission 75 % (compared to 1990 level).

## POLICIES AND PLANS: NORTHERN SEA ROUTE

Development of freight transport flows in the Arctic Ocean. Forecasts and future scenarios.

NOT ONLY COMPETITIVE SEA ROUTE TO TRADITIONAL ROUTES BETWEEN ASIA AND EUROPE, IT'S NEW ROUTE FOR SPECIAL PURPOSE WITH CONTINUOUSLY INCREASING TRANSPORT VOLUMES

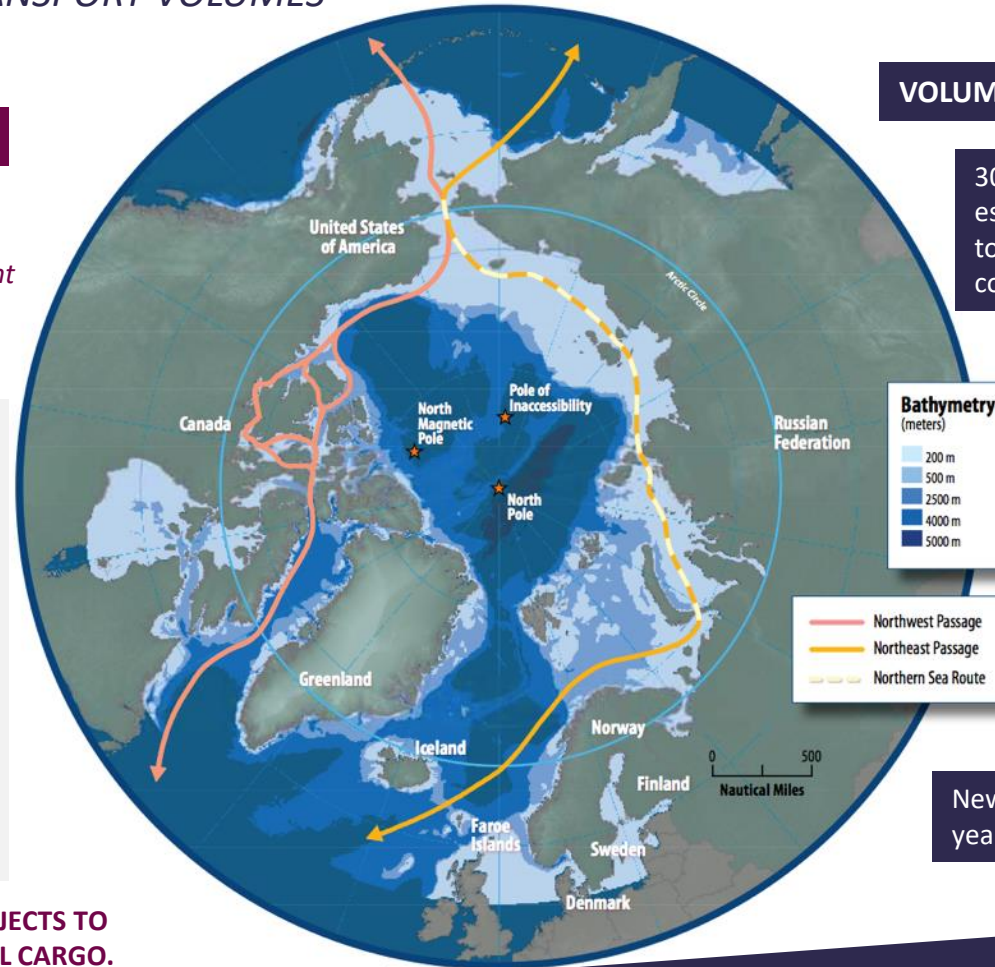
NEED FOR PARADIGM CHANGE IN ANALYSIS OF GLOBAL TRANSPORT MARKET.

### RUSSIA INVESTS HEAVILY

Russia has published a plan to increase the transport volumes of Northern Sea Route to 120 million tonnes by 2030 and 160 million tonnes by 2035 based on investment plan for the infrastructure development along the NSR, Yamal LNG project and other industries, for example mining.

- The plan covers 11 topics including port infrastructure and terminals, ice-breaking capabilities, navigational support and safety & communication network
- Development of Murmansk and Petropavlovsk-Kamchatsky sea ports to logistics hubs for international transit cargo, including the plans to a permanent container line with a fleet of container vessels with high ice class and a capacity of 5 000 containers.
- Control centre of Northern Sea Route is going to be established to Murmansk in 2020, which operates in subordination of Atomflot.

NEW PHASE FROM TRANSPORTS OF INVESTMENT PROJECTS TO DELIVERIES OF DIVERSE BULK PRODUCTS AND GENERAL CARGO.



### VOLUMES

30 million tonnes cargo through NSR in 2019, Atomflot escorted 510 vessels through the Arctic ice, which had a total gross tonnage of 30,29 million tons (+54 % increase compared to 2018)

Cargo volumes in the port of Murmansk 60,7 million tonnes (2018), strong growth trend during last three years

A new fleet of icebreaking vessels are under construction as well as Arc7 ice-classified cargo vessels.

Novatek has ordered 42 Arc7 LNG Carriers

New Leader -class ice breakers enable all-year transports in the NSR

#### TEN-T CORE CORRIDORS AND ITS EXTENSIONS TO THE NORTH. (EUROPEAN COMMISSION 2018)



- **Trans-European Transport Network TEN-T is European wide core network for all the transport modes connecting areas in the EU. TEN-T network is divided to core network and complimentary network. Core network should be at certain service level in 2030 and complimentary network in 2050.**
- **The objective is to close gaps, remove bottlenecks and technical barriers, as well as to strengthen social, economic and territorial cohesion in the EU.**
- There are also nine core corridors. Two corridors relates to the Barents Region: North Sea – Baltic and Scandinavian – Mediterranean. Both of the corridors are decided to make extensions to the north both in Finnish and in Swedish side.
- **The extensions of TEN-T core network to the north is important signal, because arctic strategies emphasize the role of arctic area in many businesses. Extension of TEN-T network connect arctic area with European markets and thus improve accessibility.**

## POLICIES AND PLANS: ARCTIC LINK

A new Arctic data cable from Europe to Asia – a boost for the business environment.

### ARCTIC DATA CABLE

- A new Arctic submarine telecom from Kirkenes in Norway to Japan will be the shortest data cable connection between Europe and Asia. Finland will be part of this 10 000 km data cable aiming the position as an international traffic node for data communication.
- Offer the lowest latency based on the geographically shortest route with the most modern data technology.
- Connect Europe, Asia and North America through northern sea cable covering approximately 85% of the world's population.
- The Arctic cable will contribute to the socio-economic development of the Arctic areas. The cable is an environmentally sustainable way to boost the global, regional and local economy.
- Offer framework for new businesses and services. For example centre for supercomputing CSC in Kajaani can strengthen its position through capabilities of the Arctic Link.



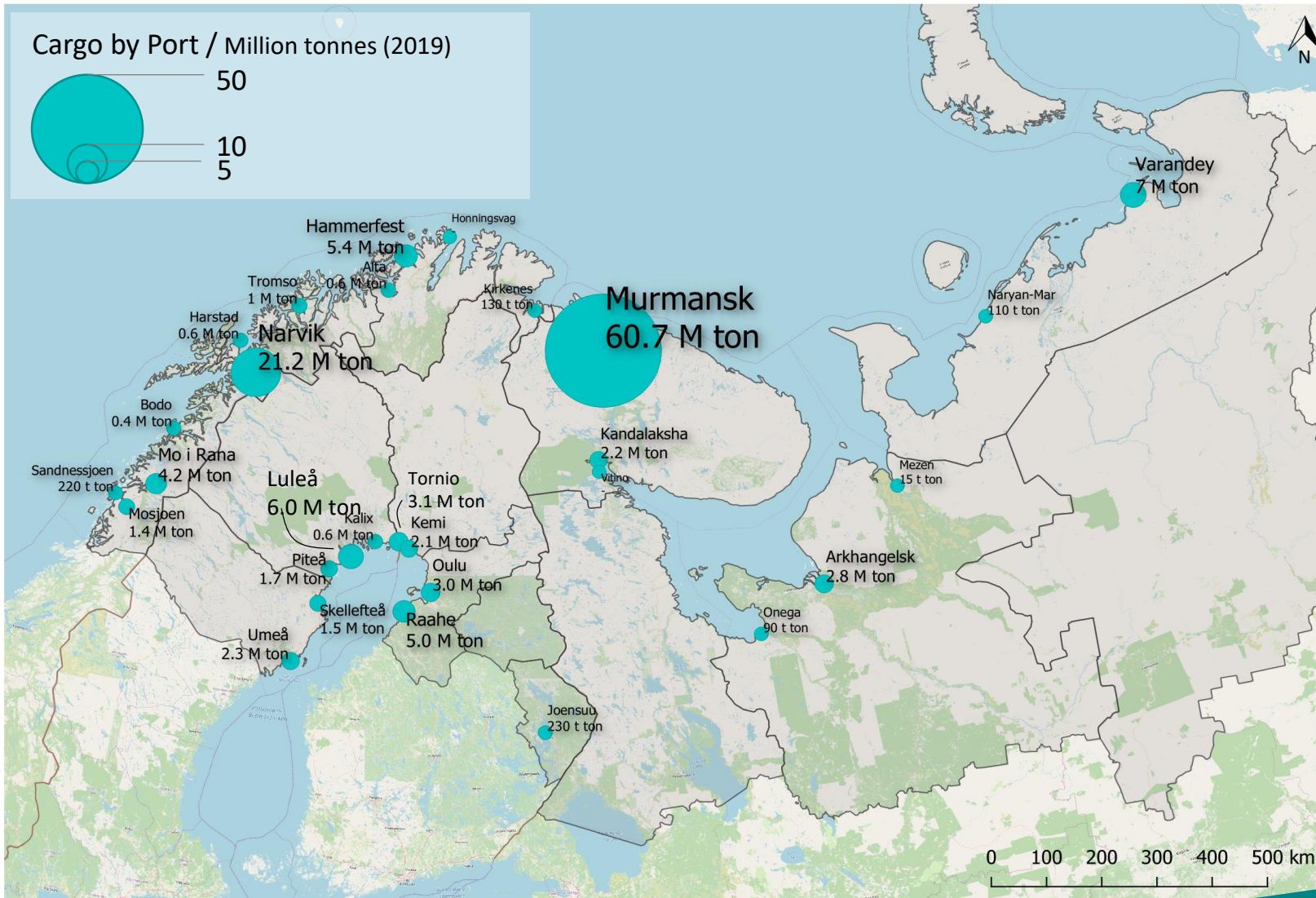


## 3.3 Current transportation flows



## TRANSPORT FLOWS IN THE BARENTS REGION

### Freight transport volumes in sea ports

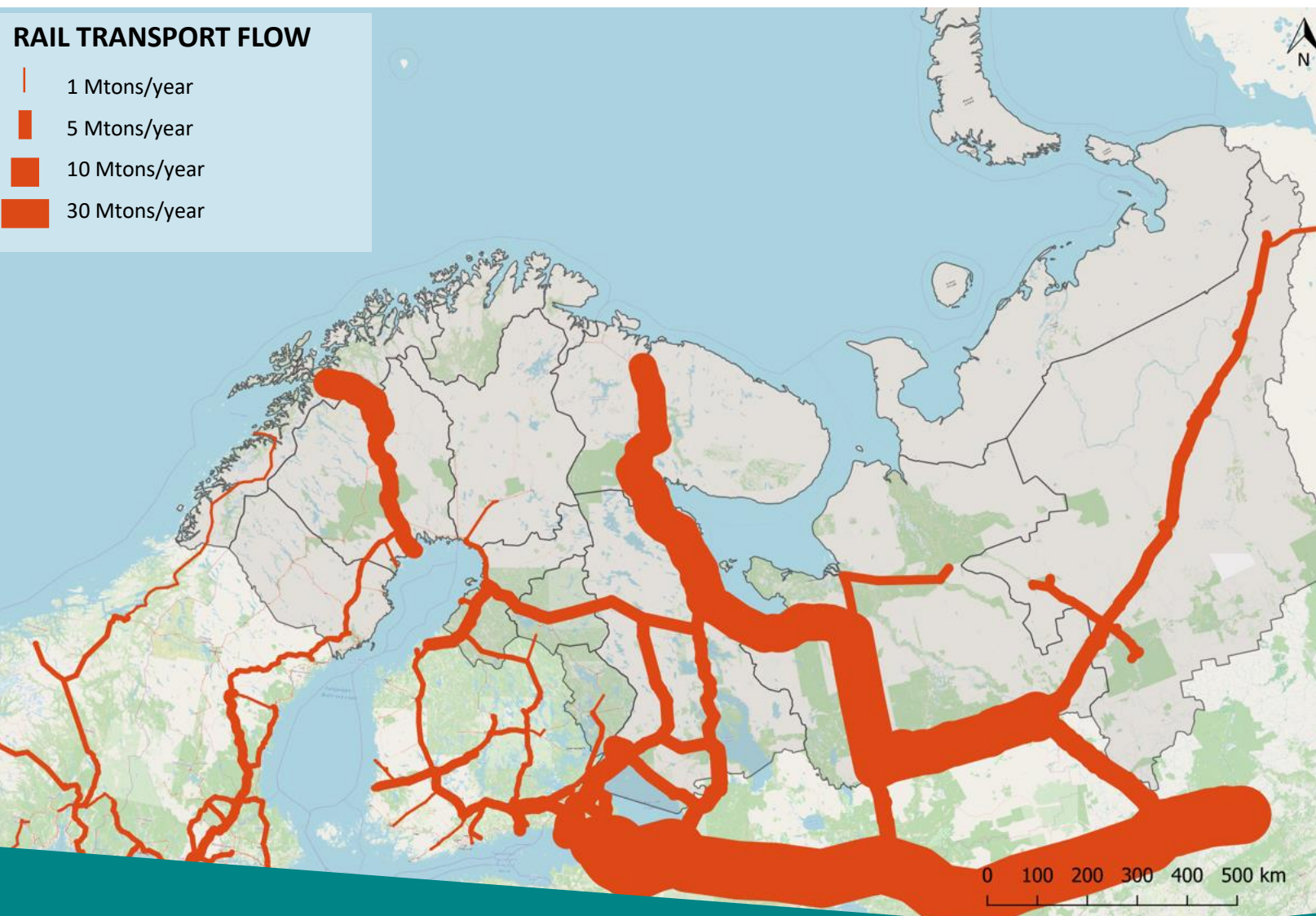


### FREIGHT VOLUMES IN SEA PORTS

- The biggest transport volumes in the Barents region relates to coal, LNG, oil and mining products. Two biggest sea ports in the area, Murmansk and Narvik relates to these product groups. In addition these sea ports are focusing also to increase of container transports and general cargo.
- The volume of Murmansk sea port has been in strong growth during last few years and is predicted to continue. Sea port of Murmansk is also western hub for increasing transport volumes in NSR.
- Sea port of Luleå has started development project “Malporten”, which is going to increase its role in transports of iron ore. At the moment increase of transport capacity and depth is estimated to be ready in 2024.

## TRANSPORT FLOWS IN THE BARENTS REGION

### Rail freight transport volumes



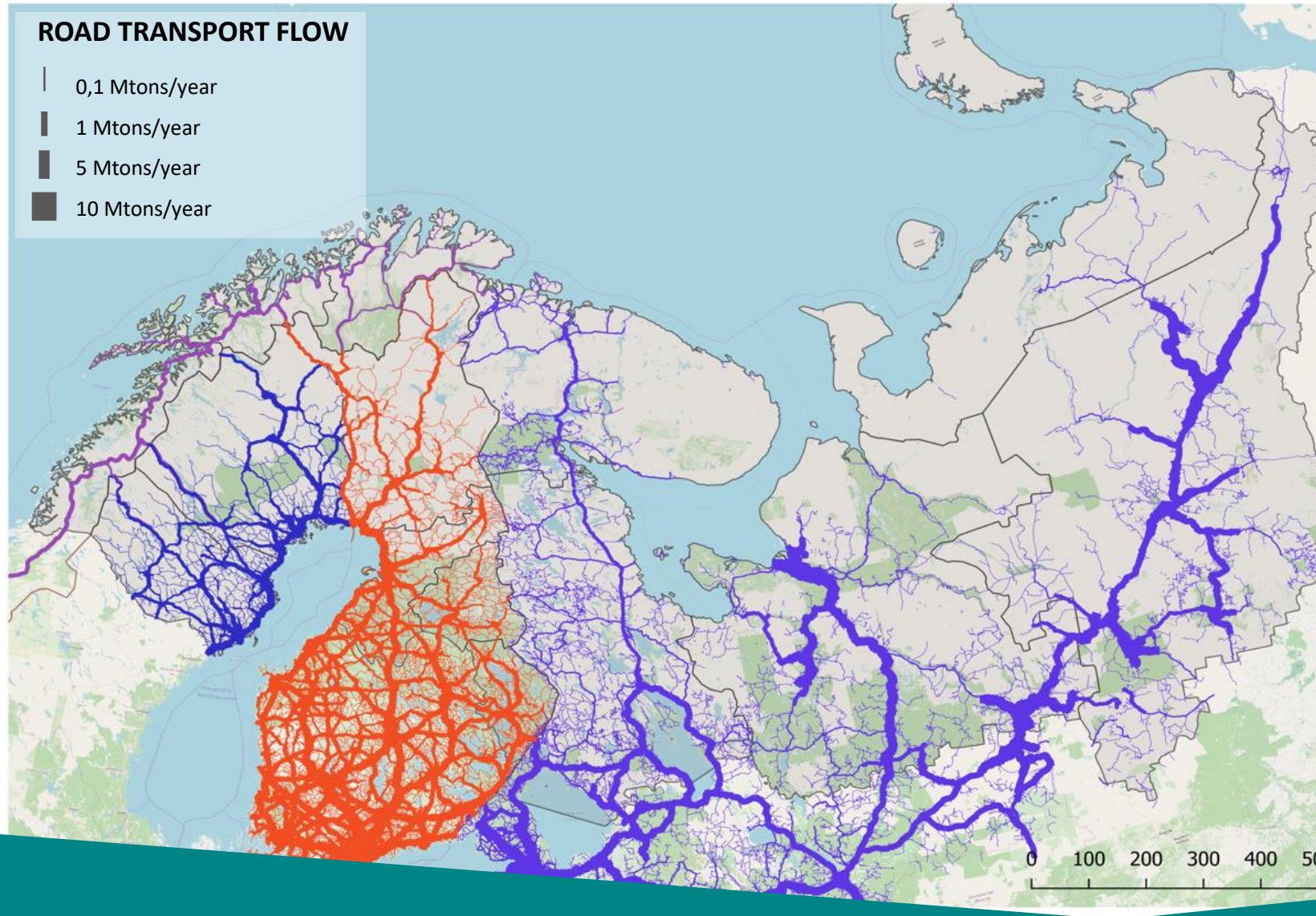
### RAIL FREIGHT TRANSPORT VOLUMES

- The highest transport volumes in rail freight transports are in Russia and in Northern Sweden/Norway. Diverse mining products are the main transport group, but also industrial chemicals and finished industrial products.
- Also in Finland the biggest transport volumes relates to Russian transit transports of iron ore, coal, industrial chemicals and diverse bulk products.
- Examination of rail transport flows emphasize the border crossing transport flows in the Barents region and the key role of certain sea ports.

Sources: Statistics Norway, Finnish Transport Infrastructure Agency, Sweden/Persontrafik och godstransporter 2010–2030 och kapacitetsanalys för järnväg, KTH, Port of Narvik and Luleå, Russia/ Joint Barents Transport plan 2019 and North West Center

## TRANSPORT FLOWS IN THE BARENTS REGION

### Road freight transport volumes

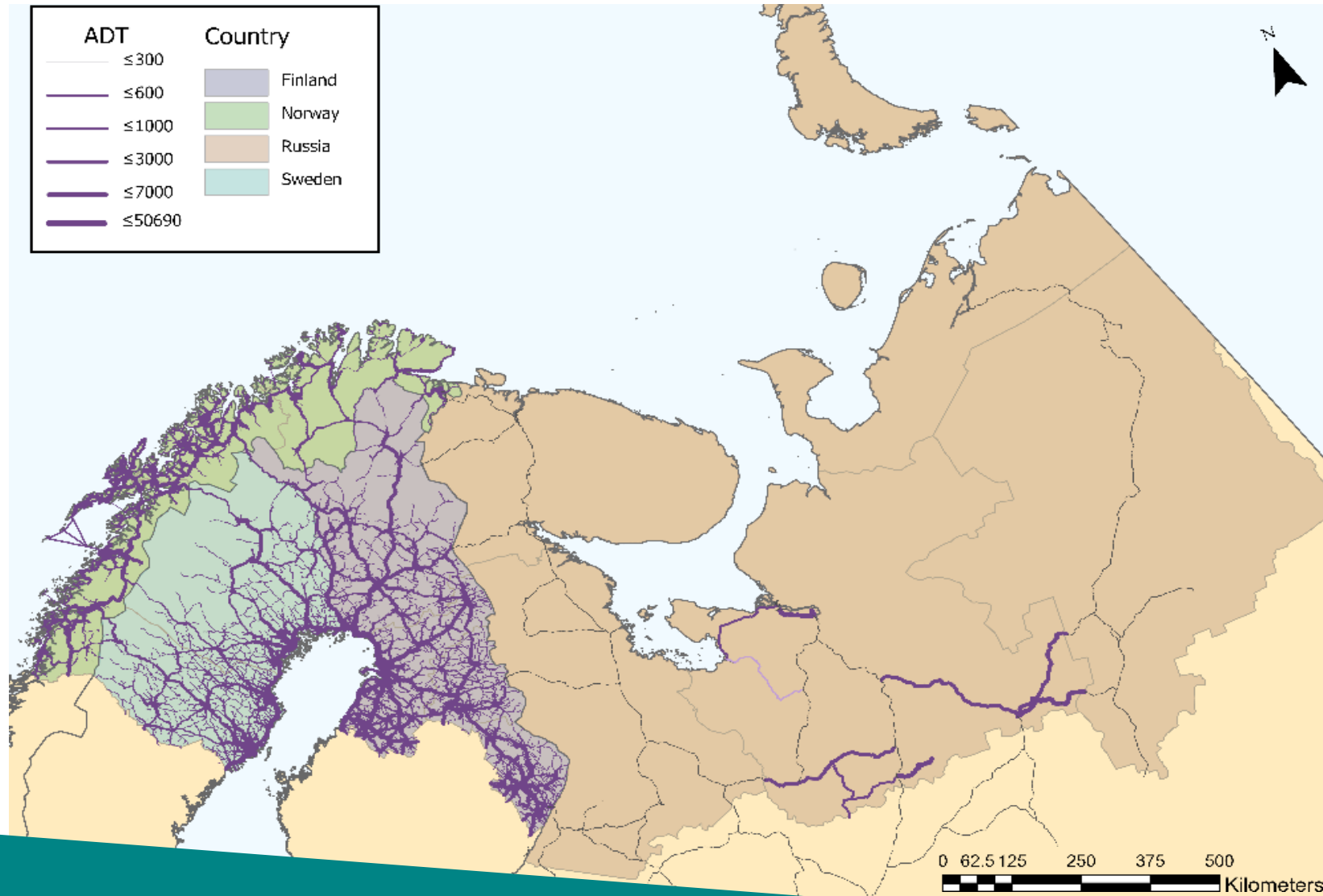


- **ROAD FREIGHT TRANSPORT VOLUMES**
- Road freight transports are more spread out than rail freight transport flows. Road freight transports are concentrated in most populated areas due to its flexibility to wider type of cargo.
- Some areas in the Barents Region are dependent on road transport system even in heavy industrial material flows, because there is lack of railway network and availability of rail transport services as well.
- Road transports are main transport mode in most of cross border transport flows in the area.
- Main transport mode in general cargo and daily consumer goods as well as food industry (mainly fish).

Sources: Norway/Statens Vegvesen, *Næringstransporter i Troms Status 2017*, *Nærings- og godstransporter i Finnmark Status 2016*, Finland/Finnish Transport Infrastructure Agency, Sweden/Trafikverket, Russia/Federal State Statistic Service)

## TRANSPORT FLOWS IN THE BARENTS REGION

### Road passenger transport volumes



### ROAD PASSENGER TRANSPORT VOLUMES

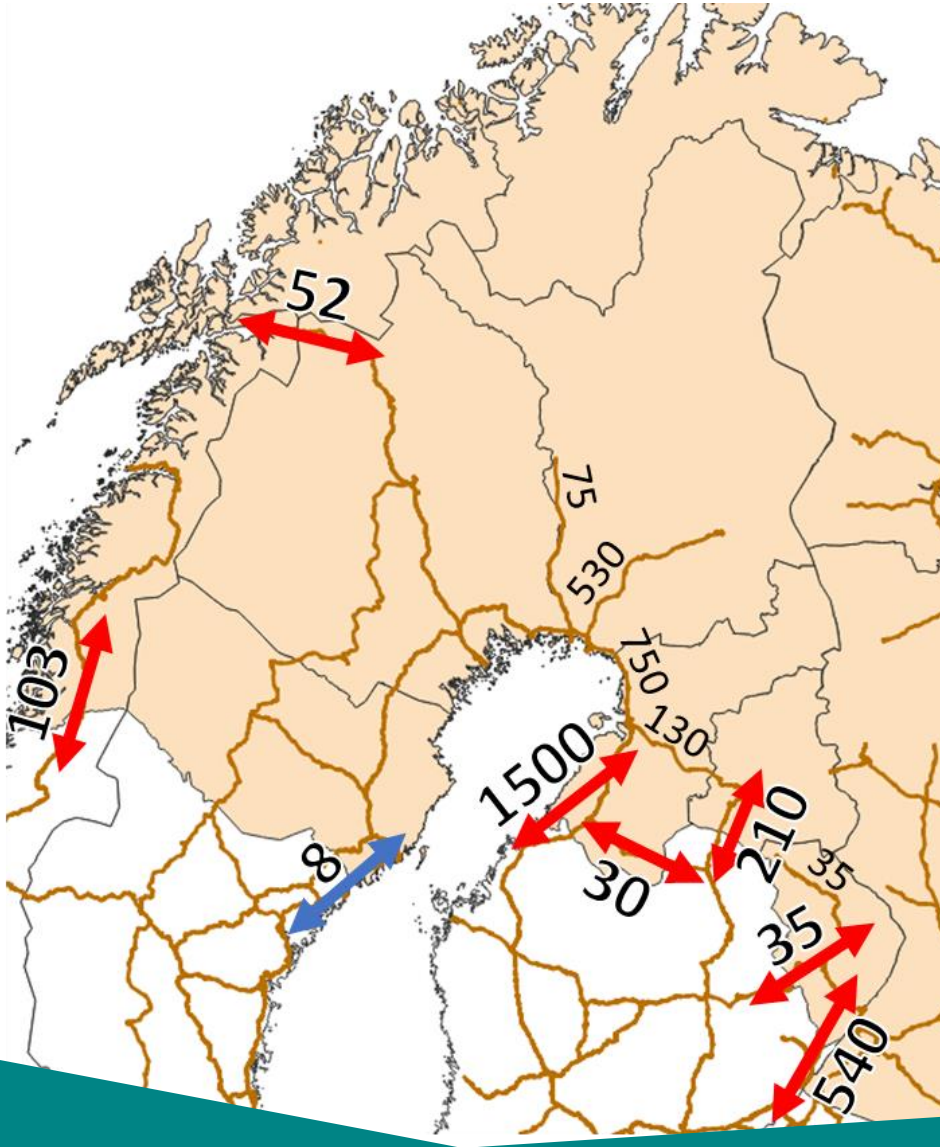
- Of a certain interest is the flow in and out of the Barents region, as well as the flows between countries within the region. The largest flows are between north and south of Finland.
- In cross-border traffic, the border between Sweden and Finland stands for the largest flows. Especially at the southernmost part, close to the Bothnian bay. This is because of the two well-integrated border cities Haparanda and Tornio. Furthermore, the flows over the Norwegian-Swedish border could partially be from traffic between north and south of Norway, trying to avoid Norwegian road taxes.
- In Russia traffic flow (only private cars) data was available for regional roads for Archangelsk region only. All the roads with no data available are marked as dark gray on the map.

## TRANSPORT FLOWS IN THE BARENTS REGION

### Rail passenger transport volumes in the Nordics Countries

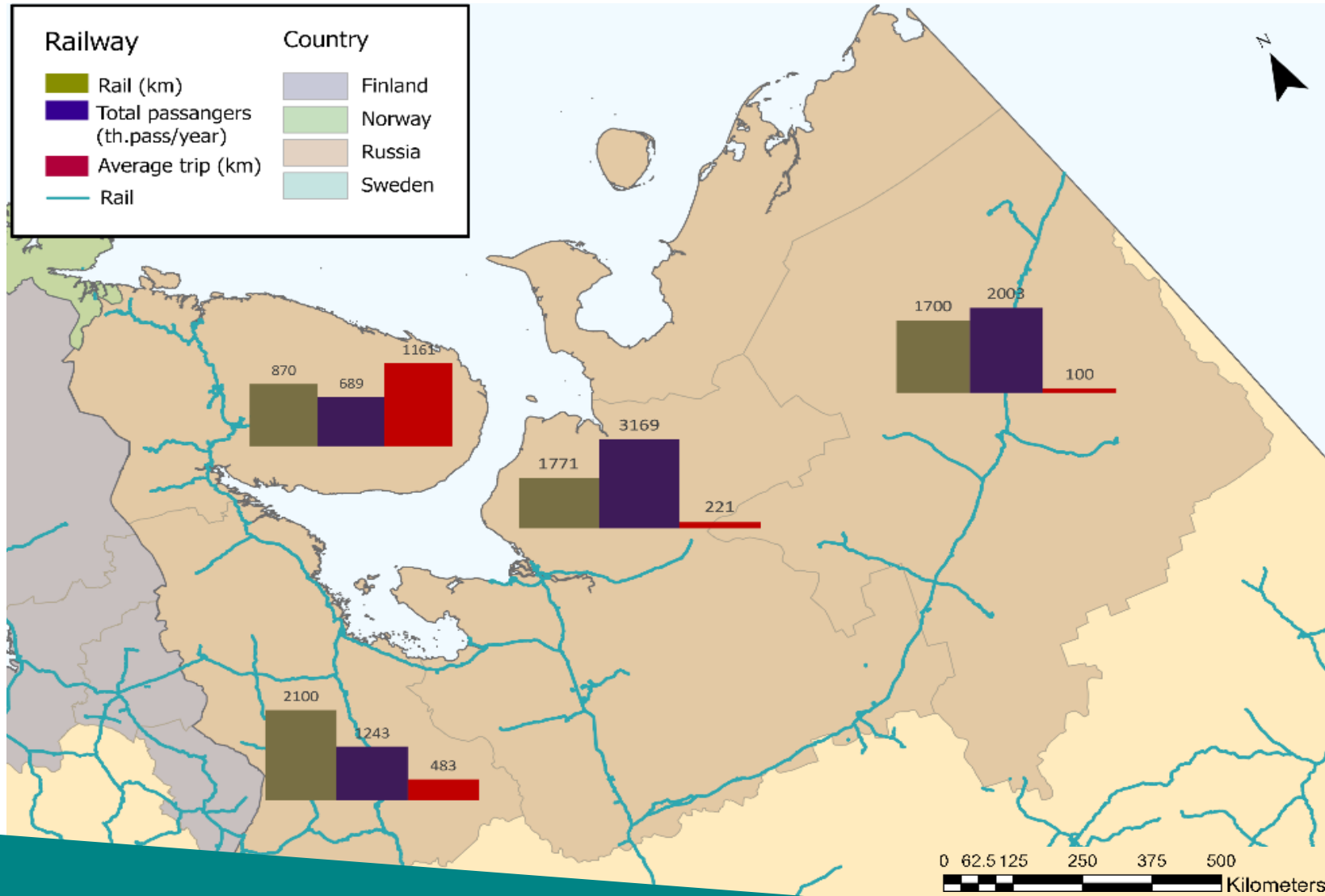
#### RAIL PASSENGER TRANSPORT VOLUMES

- Railway passengers in thousands per year (red) and number of passenger trains per day (blue) on the borders of the region. Only long-distance trains are counted. The numbers show sums of both directions. In Finland the passenger flows within the country are also displayed.
- In Norway and Finland, passenger flows on trains are available publicly (SSB and Västtrafik). In Sweden no official numbers are available because of the completely privatized railway operation market. It is, however, possible to find the number of passenger trains on some stretches. Among the three railways on the southern border of the region, only Botniabanan has regular passenger traffic. The number of daily passenger trains is 25 (8 of which were long-distance). Regional trains (Norrtåg) stood for 678 thousand trips 2019, but for the 8 long-distance trains the number of passengers is unknown.



## TRANSPORT FLOWS IN THE BARENTS REGION

### Rail passenger transport volumes in Russia



### RAIL PASSENGER TRANSPORT VOLUMES

- In Russia the only publicly available numbers are on a regional level. The total rail infrastructure length, the total number of thousand passengers and the length of an average trip are displayed per region on the map.
- In the Murmansk region, the average trip is longer than the total rail network length. This suggests that most railway trips in this region are inter-regional.
- On the other hand, in the easternmost regions of the Barents region, the railway trips are much shorter. This suggests that they are mainly regional trips.

## TRANSPORT FLOWS IN THE BARENTS REGION

### Air passenger transport volumes

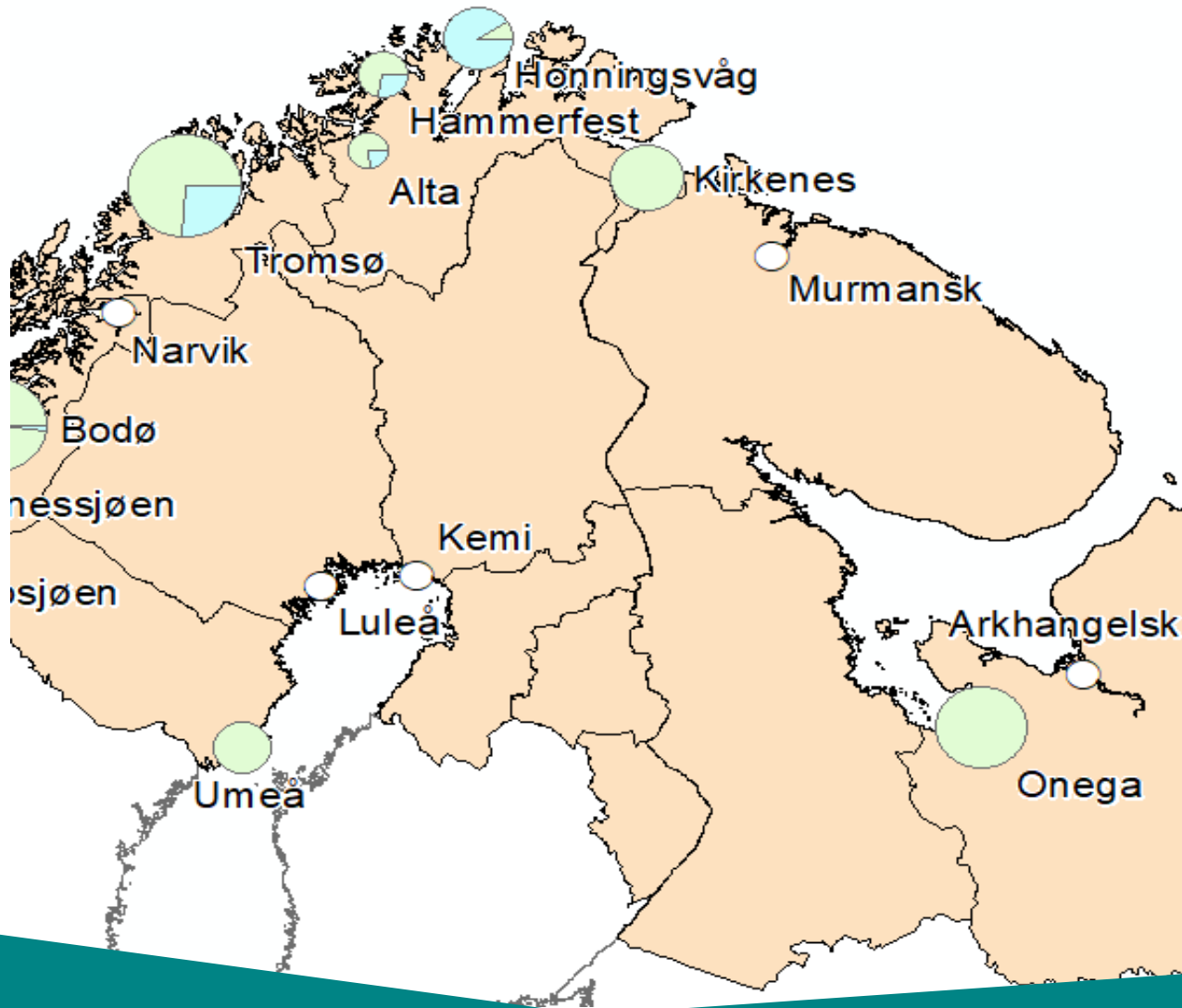


### AIR PASSENGER TRANSPORT VOLUMES

- With the region's location, in the northern outskirts of Europe, aviation is among the most important modes of transport to other Nordic cities. In Norway the network of airports is the most extensive. Most flights connect the region's airports with the corresponding nation's capital city. In Russia, many airports are also connected to St Petersburg.
- Norway stands out with many flight connections between cities within the region. Most airports connect to either Tromsø or Bodø. These are also the largest airports in the region.
- The most airports have only domestic flights. There are only a few airports that have international flight connections and those only in minority. Kittilä in Finland has the highest portion of international flights, but these are only seasonal charter. The same goes for other international airports.
- The flight connection between Barents' cities in different countries is absent, even with stopovers in the capital cities. There is no international air connection between Russian airports and other countries in the region.

## TRANSPORT FLOWS IN THE BARENTS REGION

### Sea passenger transport volumes



### SEA PASSENGER TRANSPORT VOLUMES

- Seaports of the Barents region as circles. Pie charts are shown for the seaports with more than 25 000 passengers. Green shows the ratio of passengers on normal passenger ships and blue shows the number of passengers on cruising ships. The size of each colored chart indicates the total number of passengers in the corresponding seaport.
- Bodø and Tromsø are the most operated sea ports with a total of 350 000-410 000 passengers yearly. Most of the ships are bound for other Norwegian coast towns. Onega is the largest port in the Russian part of the Barents region, with a total of 260 000 passengers per year.
- There are plans to start new cruise concepts in the Arctic Sea area. Svalbard is in growing interest, where Norway have to start consideration of vessel size limitation to avoid mega cruise ships in that area. There are luxury cruises in the Northern Sea Route and also Norwegian Hurtigruten has been interested in expanding their routes to Russian Arctic. As a summary Barents region meets growing interest in cruise tourism.



## TRANSPORT FLOWS IN THE BARENTS REGION

### Summary of analysis in freight and passenger transport flows



#### DATA AVAILABILITY IS AN ISSUE

Lack of commensurable data covering all the transport modes and the whole Barents Region is one main challenge in analysing the present state of transport sector. Therefore uncertain basis for estimation of future development regarding development of transport volumes.

**HIGHEST CARGO FLOWS FOLLOW LOCATION AND INVESTMENTS ON HEAVY INDUSTRIES, MINING, LNG, OIL AND DIVERSE RAW MATERIALS.**



#### NORTHERN SEA ROUTE IS GROWING

The cargo volumes in the Northern Sea Route is in strong growth and forms a significant logistics industry by itself, which includes both transportation and related logistics service supply and infrastructure.

→ Latest Arctic Strategy of Russia published in March 2020 emphasize a lot the development of growing and vital Arctic area with versatile business environment and structures. Utilization of huge potential of the area in focus.

→ Investments in vessel and ice breaker fleet, port infrastructure and safety technology will make NSR very attractive transport route in the future.



#### BORDER-CROSSING INFRASTRUCTURE IS KEY

Border crossing transport infrastructure as a basis of improved accessibility of the area both in freight and passenger transports is an important approach.

The roles of transport modes in different business areas, sourcing and market areas.

Cost and energy efficient transport systems for different transport volumes. Requirements for logistics are usually good service level, good cost-efficiency and moderate sustainability.

# 4 Signals of change

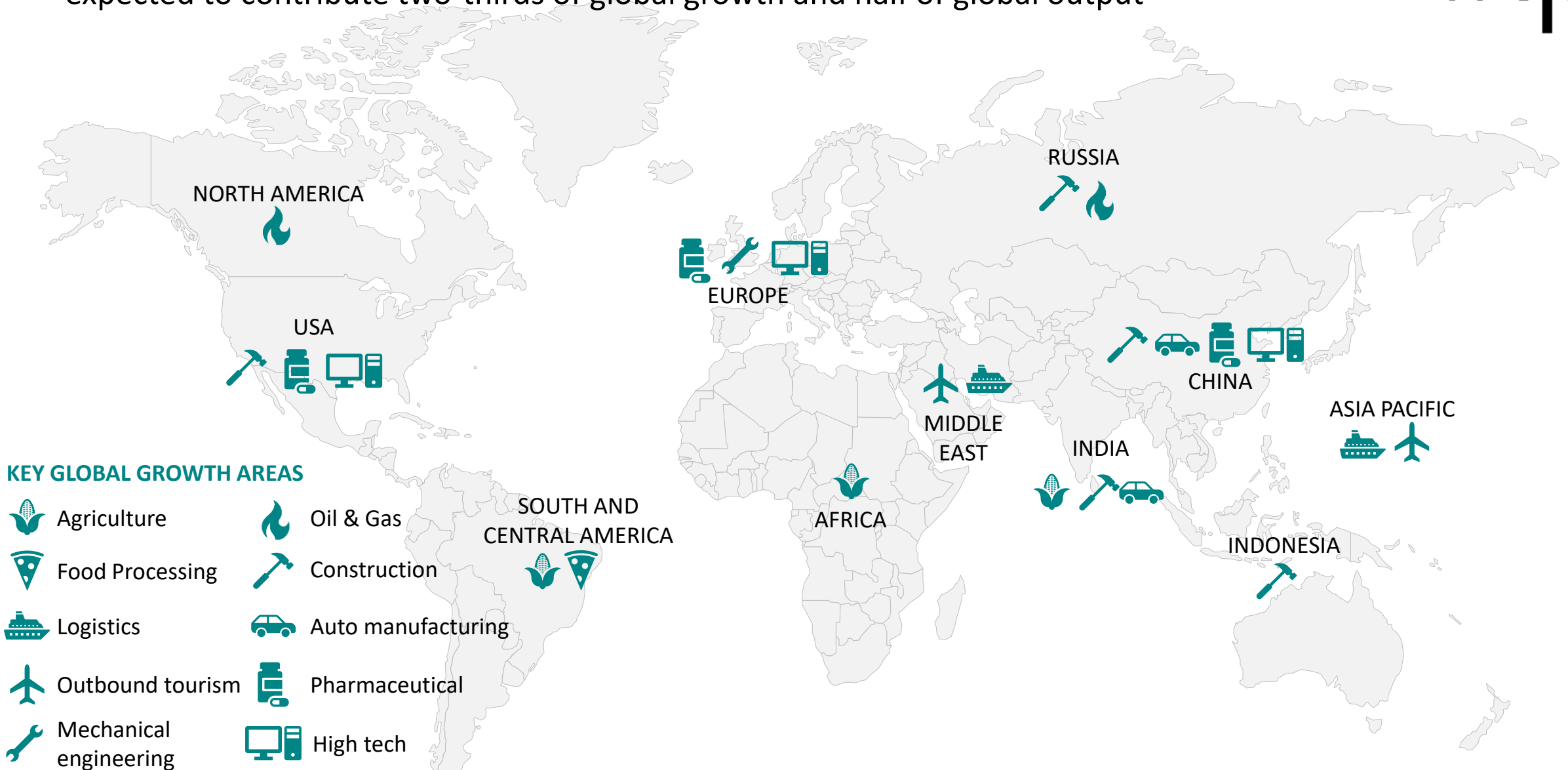


## 4.1 Changing businesses

*Disclaimer: the analyses were conducted in Jan-Feb 2020 before the Covid-19 had hit the market and hence some of the conclusions and predictions might be outdated.*

## GLOBAL GROWTH INDUSTRIES

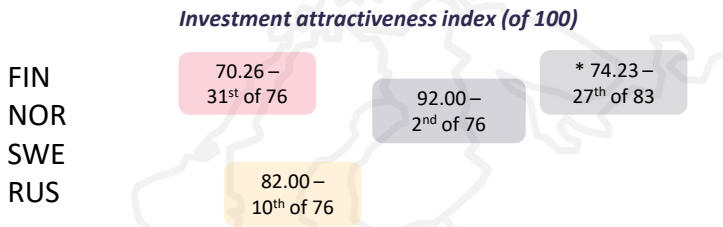
World economic gravity is shifting east and south – by 2030 developing countries are expected to contribute two-thirds of global growth and half of global output



# INDUSTRY TRENDS

## The Outlook of Mining

### CURRENT STATUS

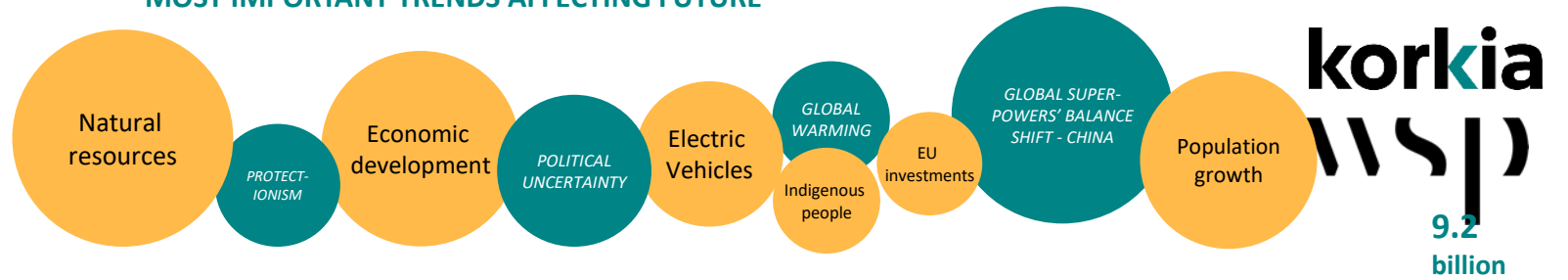


Fraser Institute – Survey of Mining Companies 2019.  
\*Figures for Russia from 2018's survey.

### LOGISTICS OF THE MINES TODAY

- Most of the logistics happen inside the mine area, where roads are built independently of public ones, and only after mine functions end then made public roads.
- Crucial raw material and end logistics are mostly directed to Europe (e.g. inside Scandinavia, Germany, Belgium) and Asia (especially China) – these all the time changing based on the market situation and pricing of minerals.
- The role of logistics between the Scandinavian countries is significant.
- The time spans from finding to implementation are very long – we already probably know the mines of 2040s.
- All countries are naturally very dependent of good connections, as the outputs are targeted to international markets.

## MOST IMPORTANT TRENDS AFFECTING FUTURE



THREATS	OPPORTUNITIES
<ul style="list-style-type: none"> <li>• Heavy dependence on import of some raw materials from Asia, but also of export to China. Increasing role of foreign owners.</li> <li>• Decreasing mineral contents.</li> <li>• Increasing uncertainty between US and China. Hostile trade policies also from e.g. Indonesia.</li> <li>• Availability of skilled workforce and capital is getting scarce.</li> <li>• Environmental trouble and criticism, social awareness.</li> </ul>	<ul style="list-style-type: none"> <li>• Uptake of EVs and plans of battery plants (e.g. Northvolt, Terrafame), break-through of energy storage.</li> <li>• EU's notice on critical resources.</li> <li>• Increasing investments to ore finding (in 2018 from 15 % &lt;), though long process to lead into concrete action.</li> <li>• Importance of sustainability and social responsibility increasing – Nordics leading in these.</li> </ul>

### IMPACT IN THE AREA

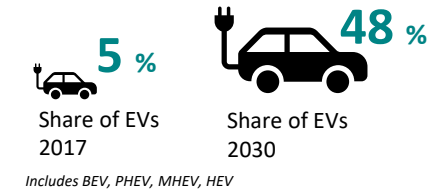
#### THE ECONOMY

The future indicates an even growing need for the minerals Barents Region provides. Thus, the basis for growth is solid. However, considering the knowledge on existing mineral sources and the decreasing content, the growth is expected to be relatively modest.

#### LOGISTICS

Most of the needs can be provided through developing existing network (leaving out e.g. Kiruna situation or new mines). However, the possibilities of the Northern Sea Route are worth examining (providing China, India).

### EMERGING TRENDS TO FOLLOW

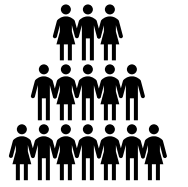


Cumulative deployment capacity of energy storage market

7.8 billion



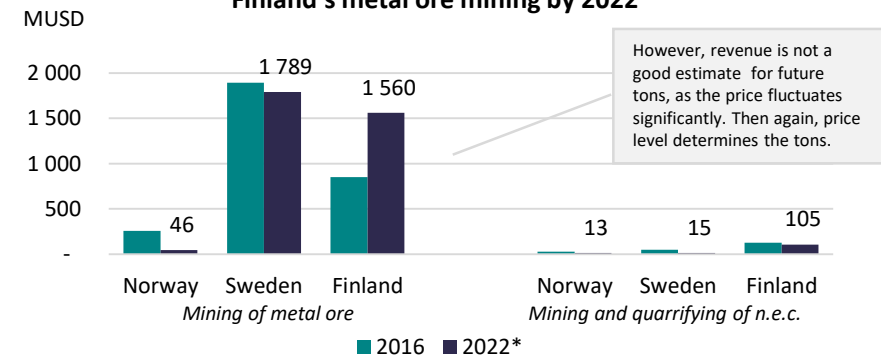
World population 2020



World population 2040

The need for minerals is increasing in tremendous numbers even if recycling is improved.

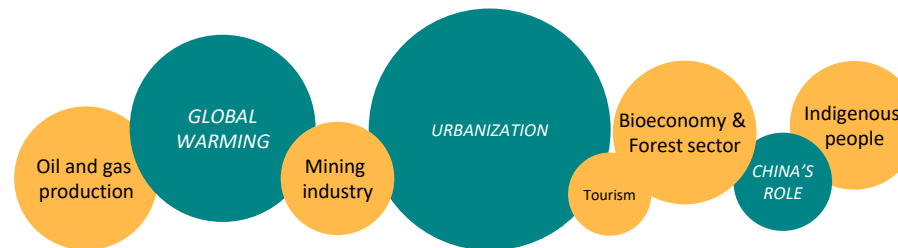
### Past revenue forecasts have indicated growth mainly in Finland's metal ore mining by 2022



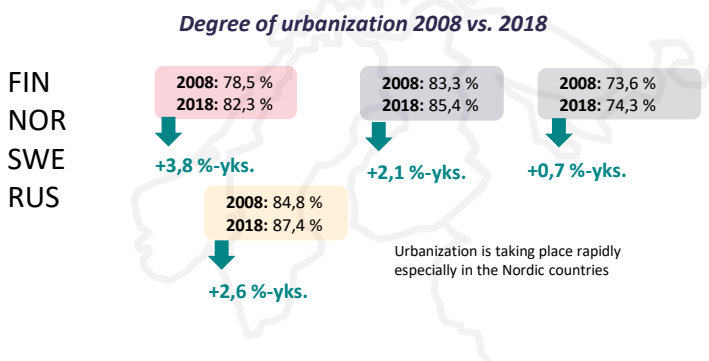
Forecast not fully comparable between countries. The figures include areas outside Barents.

## INDUSTRY TRENDS

# The Outlook of Primary Production



### CURRENT STATUS



### LOGISTICS OF PRIMARY PRODUCTION TODAY

- Agricultural activity in Finland, Sweden and Norway is grassland livestock farming - dairy and meat industries.
- Reindeer farming has an especially strong position in the Russian Barents region. In Sweden and Norway it is closely connected to the rights of indigenous people.
- Growing of crops outside grassland is relatively rare.
- The agricultural production is rather local, serving either directly local industries (e.g. gas sector in Russia), set national targets for food security (especially Norway) or arctic tourism through the "local food" trend.
- Therefore, except for fish industry, the logistics of agricultural products is rather national and local.
- However, creating new logistics systems in the area might provide significant opportunities as the continuing centralization of farming activities will further challenge food production in the area making small outside firms vulnerable.

### THREATS

- Centralization of agricultural areas and urbanization.
- Competing use of arable land – e.g. bioeconomy, mining, gas and energy sector.
- The rights of indigenous people conflicting with other land uses.
- Climate change to some degree, e.g. more pesticides and worse snow conditions.
- Generational changes during the next 10 years – will future farmers be found?

### OPPORTUNITIES

- Climate change prolongs the growth season and allows for new crops in the Barents region.
- Major shifts in policy, like has been seen in Russian Northern territories where wages are higher than average in the country, or in Norway the obligation for major dairy and meat companies to collect farm products from all areas.
- Tourism and local growth industries support local production in hot spot areas

### IMPACT IN THE AREA

#### THE ECONOMY



The on-going centralization and urbanization trends are likely to significantly reduce the number of farms in the area. Though climate change somewhat improves the conditions for agriculture, it is unlikely to offset the numerous negative trends and retiring of farmers. Due to latitude, the growth season will remain relatively short. However, increasing tourism areas and certain existing hot spot areas can benefit.

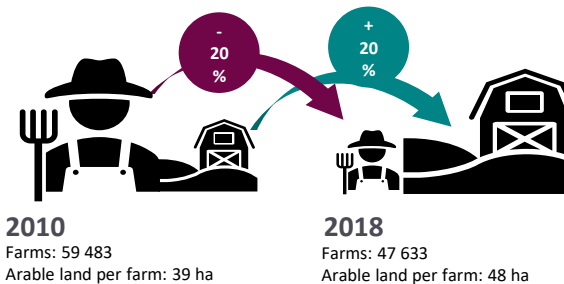
#### LOGISTICS



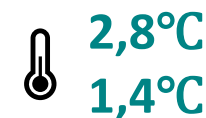
Decreasing amount of farmers will further difficult logistics of food in the area where distances are long. The regionalization of logistics around hot spot areas only is likely.

### EMERGING TRENDS TO FOLLOW

In all countries, the centralization of production together with urbanization is a trend. For example, in Finland 2 % of farms quit every year. Meanwhile, the medium size grows.



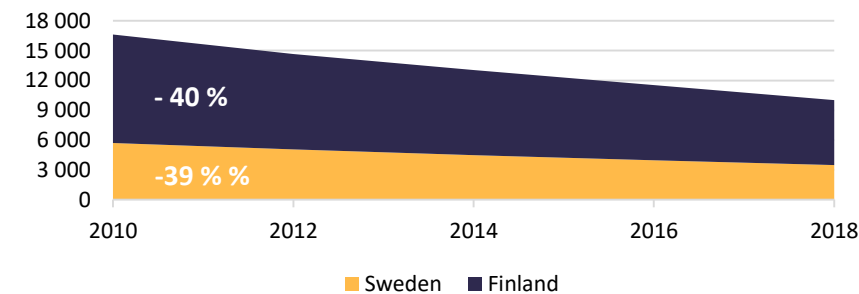
Expected temperature increase 2031-2060 in total (Norway)



Expected temperature increase in winter vs. summer.

At the same time – heat waves and rainfalls become more common.

Example of the trend - Number of milk producers that deliver milk to dairies in Sweden and Finland 2010-2018



Note. Full country, Finland's numbers are average.

## INDUSTRY TRENDS

# The Outlook of Blue Economy

### CURRENT STATUS

Together the Barents Region forms a unique ecosystem where other countries produce, and others deliver to end customers

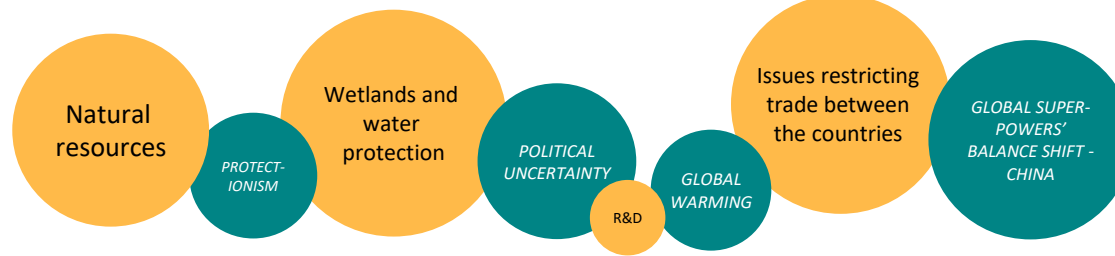
FIN  
NOR  
SWE  
RUS



### LOGISTICS OF THE BLUE ECONOMY TODAY

- Northern Norway and Russia (Murmansk area) are significant global producers of fish. Finland's and Sweden's role, is on the logistics chain to provide easier access to European market, as in both countries the own blue economy takes mostly place in the southern parts in smaller scale.
- The main markets for Norwegian fish operated through Finland are Eastern and Central Europe.
- 80 % of Norwegian fish products go to Europe, where most significant markets include Poland, France, Denmark, United Kingdom and Spain. Though being dominant, the role of Poland has been decreasing. Asia becomes second after Europe.
- Trade restrictions have been very important barriers in the past – impacting both the relations of Norway and Russia, and Norway and China.

## MOST IMPORTANT TRENDS AFFECTING FUTURE



THREATS	OPPORTUNITIES
<ul style="list-style-type: none"> <li>Fishing of wild fish becomes more restricting to growth due to diminishing resources.</li> <li>Already experienced on-off trade barriers (Russia, China) and the risk of new ones due to increasing role of China and its dominant role in the global fish market.</li> <li>The development of oil price directly influences the demand for fish in Russia.</li> </ul>	<ul style="list-style-type: none"> <li>High price of fish keeps also interest in production high.</li> <li>New production techniques are developed, especially in Norway. Also demand for new integrated solutions such as drugs made from fish remains increases.</li> <li>The developed relationship between China and Norway.</li> <li>Climate change moves fish towards the north.</li> </ul>

### IMPACT IN THE AREA

#### THE ECONOMY



Global forecasts for fish market indicate only modest growth: catches increase by 1 % and consumption by 6 % by 2030. The role of China is significant, and as the production in Latin America has problems, there is a slot for increasing production as many resources are utilized already. However, in the longer-term Barents Region is likely to significantly benefit from climate change. Development from “fish” towards full “Blue Economy” continues. Growth will focus on Norway and Russia.

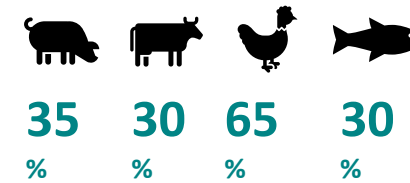
#### LOGISTICS



A close co-operation logistically to support blue economy is likely to continue. Northeast Passage might make some current logistics route look different in the future.

### EMERGING TRENDS TO FOLLOW

Traditional diets are changing.



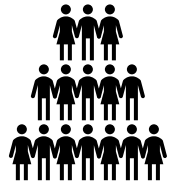
Percentage growth in demand for animal protein between 2015-2035.

**korkia**  
WSP  
9.2 billion

7.8 billion



World population 2020

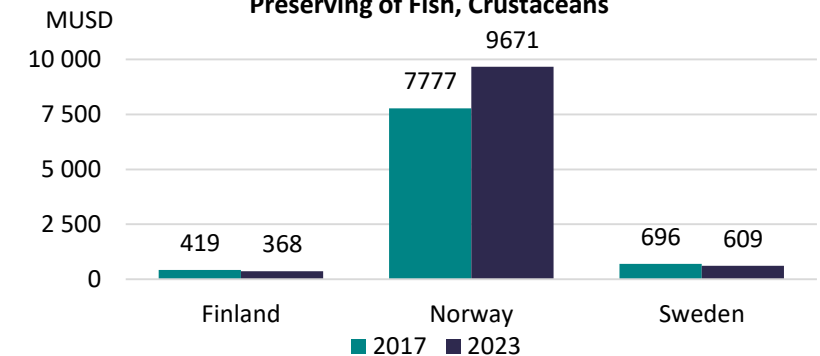


World population 2040

Already by 2030 we need globally:

50% more food      30% more clean water

### Forecast of Industry Revenue of Processing and Preserving of Fish, Crustaceans



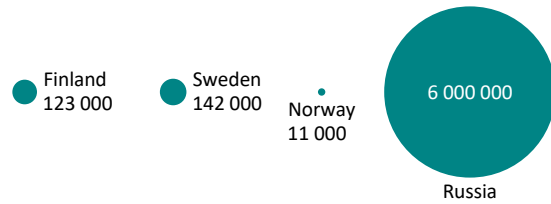
Note. Full country, e.g. in Finland most activity takes place in the Southern parts.

# INDUSTRY TRENDS

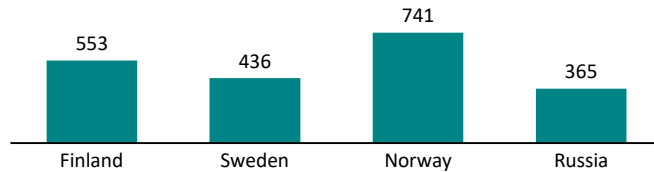
## The Outlook of Waste Industry

### CURRENT STATUS

Total annual waste production, 1000 tonnes (2018)



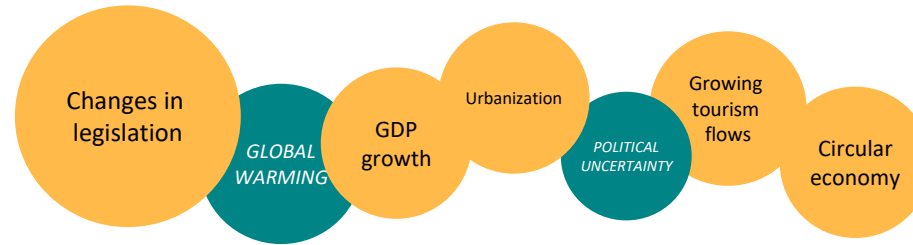
### Municipal waste production (kg per inhabitant)



### THE WASTE INDUSTRY TODAY

- The Nordic region entails some of the most matured and developed waste management systems in Europe. Many aspects of the waste and resource management industry in Finland, Norway and Sweden are world-leading.
- In Russia, however, the situation is very different. Most of the waste is landfilled, and the industry is underdeveloped.
- EU regulates the industry strongly. The recent changes in the EU waste directives demand a significant change away from incineration towards recycling and require big efforts also from the Nordic countries.
- Characteristic for the industry in the Barents Region are long waste transportation routes to the waste management facilities.
- One of the characteristics is the large-scale mining industry, which produces significant amounts of industrial waste in the area.

## MOST IMPORTANT TRENDS AFFECTING FUTURE DEVELOPMENT



### THREATS

- Cross-border collaboration is limited due to legislation – the country where the waste is produced is responsible for managing it.
- Long transportation distances in the north for waste to be handled – separating the waste increases the transportation flows.
- Mining industry is a big waste producer, which might endanger the fragile environment of the Barents Region in the future and poses a threat to other industries such as tourism.

### OPPORTUNITIES

- Growing tourism increases municipal waste production and needs for waste management which creates new possibilities for businesses in the industry.
- Recycling and material recovery opens new business opportunities.
- Public-private collaboration in building waste management facilities.
- Underdeveloped waste recovery levels in Russia open business opportunities for the Nordic companies in the industry – room for new collaboration in the Barents Region.

### IMPACT IN THE AREA

#### THE ECONOMY



Waste management industry mirrors the economic changes in the area. In the Barents Region, the industry is highly linked to the tourism growth and other big waste producing industries such as mining. Hopefully, the underdeveloped waste recovery and circular economy provide new shared possibilities in close future.

#### LOGISTICS



The municipal waste transportation flows are expected to grow due to growing tourism and the recent EU recycling that increases waste separation and hence increases the fleet needed.

### EMERGING SIGNALS TO FOLLOW

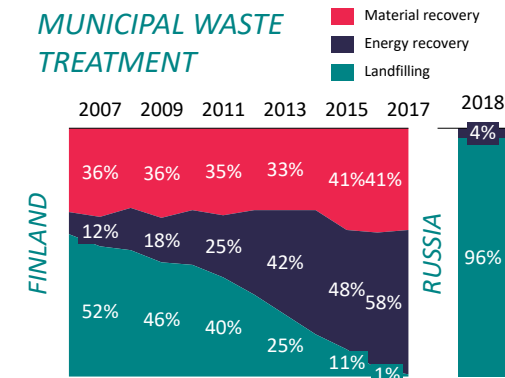


Regulation is a strong driver in the waste management industry. The current push towards circular economy practices by the EU will influence the industry strongly in the Nordic countries.

### EU-LEVEL TARGETS FOR RECYCLING

	By 2025	By 2030
All packaging	65 %	70 %
Plastic	50 %	55 %
Wood	25 %	30 %
Ferrous metals	70 %	80 %
Aluminium	50 %	60 %
Glass	70 %	75 %
Paper and cardboard	75 %	85 %

### MUNICIPAL WASTE TREATMENT



### WASTE GENERATION IN EUROPE

millions of tonnes per year



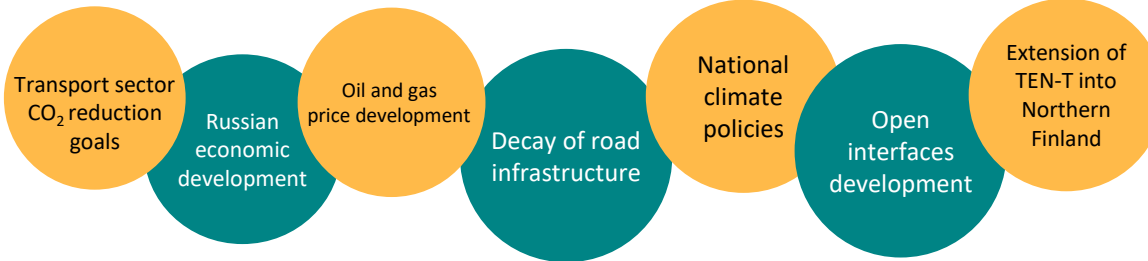
Waste generation in Europe and Central Asia is expected to grow by 25 % by the year 2050 reaching 490 millions of tonnes per year.



## INDUSTRY TRENDS

# The Outlook of Logistics

## MOST IMPORTANT TRENDS AFFECTING FUTURE



## PRIORITIZED TRANSPORT CORRIDORS



## LOGISTICS SITUATION TODAY

- Such as waste management, the development of logistics is dependent on other economic activities, such as opening of mines, port constructions etc.
- EU has set ambitious CO<sub>2</sub> reduction targets for road transport requiring increased usage of railways, waterways and alternative powertrains (gas, hydrogen, electricity and biofuels).
- Finnish and Russian road networks in Barents region do not support increase in road transport logistics due to maintenance issues arising from lack of resources and extreme weather. Infrastructure enabling efficient East-West transport solutions is limited, with the railroads an exception.
- Transport companies operating in Barents region are not willing to pay more for environmentally friendly vehicles nor is the required infrastructure (LBG/LNG/EV-charging stations) in position to serve the fleets.
- Arctic oil and gas resources seem too expensive to exploit given the current and forecasted prices. This reduces investment needs to harbors and other supporting infrastructure, that could also support other logistical service and enhance the regional competitiveness.

THREATS	OPPORTUNITIES
<ul style="list-style-type: none"> <li>• Skilled workforce is already hard to obtain, and deficit of drivers is expected to grow.</li> <li>• Deterioration of logistics infrastructure especially from Russian side reduces competitiveness of the region.</li> <li>• Continuous fragmentation of population and economic centres makes investing in infrastructure unprofitable.</li> <li>• Streamlining the supply chain that takes place with e.g. HCT is not possible in some areas.</li> </ul>	<ul style="list-style-type: none"> <li>• Platooning, autonomous vehicle technologies and ITS solutions of 2030s could reduce the pressure arising from labour shortage and increase road transport efficiency considerably.</li> <li>• Finland provides effective transit services for goods transported from Barents region, especially if cross-border challenges are solved.</li> </ul>

### IMPACT IN THE AREA

**THE ECONOMY**

Efficient logistics solutions and supporting infrastructure are lifelines of Barents economy. Given the efficiency improvements in logistics caused by ITS solutions, new powertrain technologies and cross-border collaboration, economy is expected to gain slight boost.

**LOGISTICS**

By combining ITS solutions, new vehicle technologies and PPP-collaboration transport chain efficiency is increased. This means that fewer logistical units are needed to serve the regional needs. As a result of efficiency leap, the volume of logistical units is expected to decrease.

## EMERGING TRENDS TO FOLLOW



**Heavy duty vehicle powertrain development** - By late 2030s vehicle fleets of Barents region (excluding Russia) run mostly on electricity, hydrogen or biogas – A fundamental change required for the supporting infrastructure.

**Digitalization of logistics** – Corridor as a Service concept for logistics companies combines ITS systems to intelligent logistics creating more efficient logistic chains. CaaS concept relies on standardized data, transparent digital services, technological solutions such as precise positioning and real-time data transmission and PPP-collaboration. CaaS concept has the potential to greatly enhance logistics of Barents region.

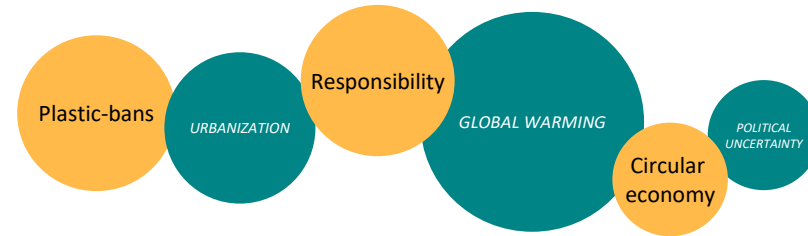
**Technological gap between Russia and West** – Russian government has no interest to promote competing vehicle technologies that could replace diesel. Scandinavian countries and companies on another hand have interest to replace diesel with biogas, electricity or hydrogen. This development gap can decrease transit efficiency of road transport.

*Number of passenger cars in use, per 1 000 inhabitants – Number of passenger cars correlates well with the road infrastructures conditions affecting logistics.*

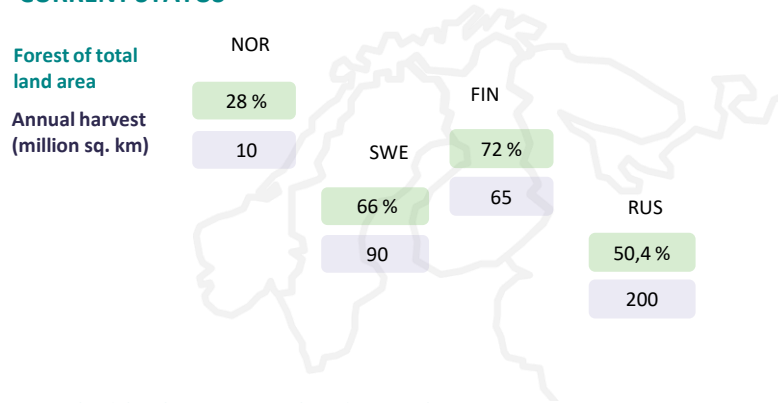


# INDUSTRY TRENDS

## The Outlook of Bioeconomy and Forestry



### CURRENT STATUS



THREATS	OPPORTUNITIES
<ul style="list-style-type: none"> <li>Urbanization and lack of educated employees in the area.</li> <li>Decrease in investments in the Nordics, Asia is a growing market.</li> <li>Forest protection restricts the amount of usable forest assets.</li> <li>Growing competition threatens the current situation in the Nordics.</li> <li>The two conflicting roles of the forest industry – forests as a resource vs. forests as a natural asset. The climate change discussion might make the exploitation harder in the future.</li> <li>Decreasing paper consumption pushes the industry to invest to “now”.</li> </ul>	<ul style="list-style-type: none"> <li>The forests grow faster than ever due to climate warming, logging of old forests and increase in carbon dioxide levels.</li> <li>New technology enables the production and use of renewable biological resources in new ways.</li> <li>The production is more sustainable and efficient.</li> <li>The products have similar properties as products based on fossil carbon and hence can replace them. The climate change pushes demand away from fossil-based products and the need for alternative materials grows.</li> <li>The vast forest assets in Russia are a big opportunity for the entire area, the government has acted in developing the industry further in Russia during the coming years.</li> </ul>

### EMERGING SIGNALS AND INDUSTRY TRENDS

#### Bioplastics



The global market for bioplastics is predicted to grow by roughly 25 % over the next five years.

#### Bio-based fuels



Targets to reduce transportation emissions are pushing the development of biofuels – the production levels are not on track with the sustainable scenario needed.

#### Certified wood

+10%

Total certified forest area growth (PEFC&FSC) 2013-2016, the growth is expected to continue as the consumers are interested in responsibility.

#### Forests as carbon sinks



One of the main tools for carbon offsetting is using forests as carbon sinks. This might restrict the harvests and increase wood price.

### BIOECONOMY AND FORESTRY TODAY

- Bioeconomy includes value creation that is based on the production and use of renewable biological resources in stead of non-renewable carbon. It consists of several different sectors and industries such as agriculture, forestry, fisheries and aquaculture.
- In the Barents Region the main sector in bioeconomy is forestry and wood-based industries. In Finland, for example, half of the bioeconomy is based in forestry. Forest industry has both great economic and sociocultural significance especially in Russia, Finland and Sweden.
- Russia's vast forests are a big asset, and during the recent years the potential they entail have been taken into use. Still, most of the forest is not assessible and hence cannot be utilized. Lack of investments hinder the development in Russia.
- The Nordic countries are world-leading when it comes to innovation and new applications of forest-based raw materials such as lignin and cellulose.
- In the Nordic countries, many of the major companies operating in bioeconomy also process the raw material into more advanced materials and products in the area.

### IMPACT IN THE AREA

#### THE ECONOMY



Bioeconomy is already a significant employer in the Barents Region. As the sector is expected to grow in the future, it will support the economic growth in the area. Developing the industry in Russia could open new doors for co-operation.

#### LOGISTICS

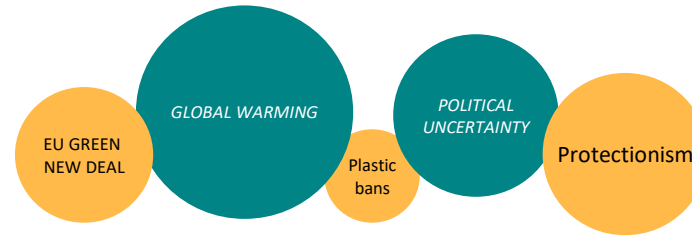
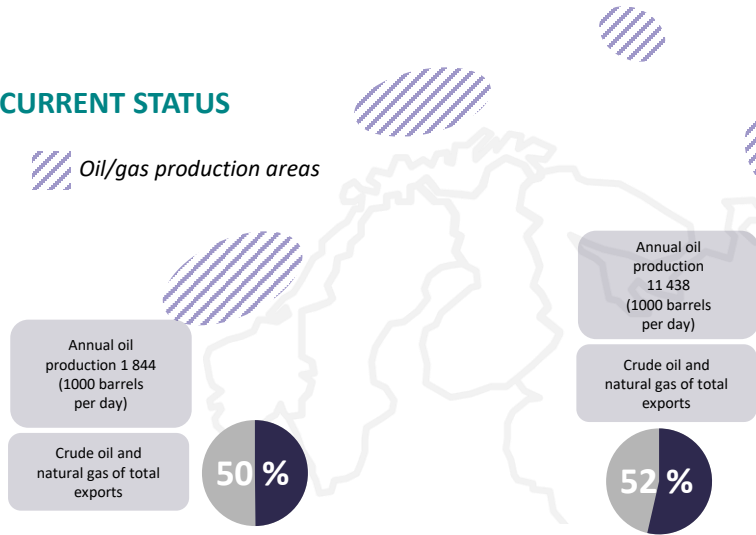


Wood transportations form a significant transportation flow in the area, but the flows are expected to remain at the same level as now. The new material flows grow, but not significantly.

## INDUSTRY TRENDS

# The Outlook of oil and gas industries

### CURRENT STATUS

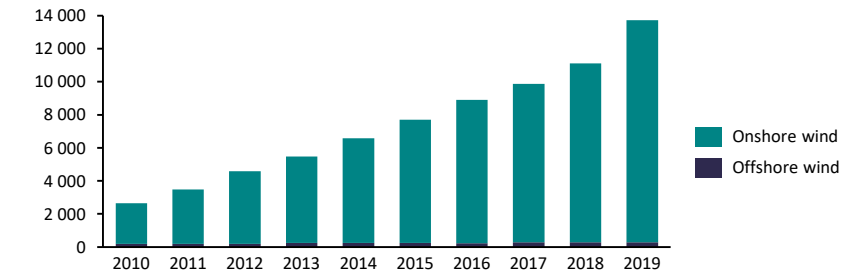


THREATS	OPPORTUNITIES
<ul style="list-style-type: none"> <li>Global warming and the growth of renewable energy resources.</li> <li>EU's green deal and potential carbon taxes would force Russia to open the value chain and emissions it causes – and increase production costs.</li> <li>Russian mindset of endless resources causes low regulation in the Arctic, which causes big damage for the environment.</li> </ul>	<ul style="list-style-type: none"> <li>Undiscovered potential still exists.</li> <li>Current regime in Russia supportive for the industry growth.</li> <li>World oil demand is still growing.</li> <li>The industries demand a lot of supporting services around them such as primary production and research, fostering the livelihood of the area.</li> </ul>

### EMERGING SIGNALS AND INDUSTRY TRENDS

Renewable energy is attracting investments. In the end of 2019 the global built capacity of renewables was 2 537 GW with 7,4 % global growth. Wind and solar form 90% of the new capacity. Wind power is currently one of the most cost-efficient ways to produce electricity. Major wind power projects have been launched and are in planning in the Barents Region.

### Total installed wind power capacity (MW) in FIN, SWE, NOR & RUS



IRENA 2020

### THE INDUSTRY TODAY

- The petroleum industry is Norway's largest industry. Today, Norway is the 8<sup>th</sup> largest producer of oil and the 3<sup>rd</sup> largest producer of gas in the world.
- The petroleum industry is in the Barents Sea, mainly in the west, but substantial exploration activity is ongoing both in west and east of the Barents Sea.
- Oil and gas production in the Russian part of the Barents Sea, Komi Republic and the Nenets Autonomous District is expected to remain stable in the coming years.
- In Northern Norway there are high expectations for future explorations and issuance of new permits and production growth, still. All in all, the share of oil production in the Barents Region is expected to increase in near future.
- Norway is investing 32 billion euro in the development of the petroleum sector during the period of 2018-2026
- In Russia, the oil and gas industries are strongly linked to the overall narrative and identity of the country, and their role is not likely to change any time soon.

### IMPACT IN THE AREA

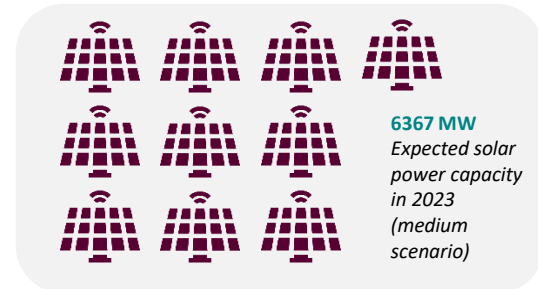
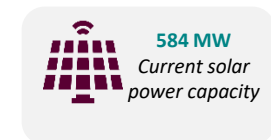
**THE ECONOMY**

Depending on the oil and gas price development, the industry has substantial influence on the economic performance of Norway, and especially Russia. In both countries the industries represent a significant employer and income for the entire economy.

**LOGISTICS**

In the short term, expected growth will increase maritime logistics flows. In the long term, however, the oil and gas logistics flows would decrease in case the renewable energy resources of the Barents Region would be used in their full potential.

### Solar in Russia

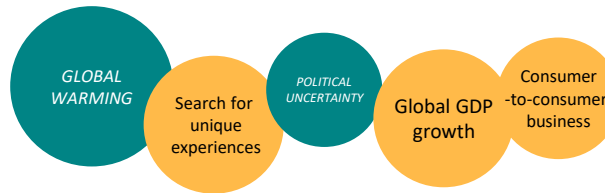


Solar Power Europe 2019

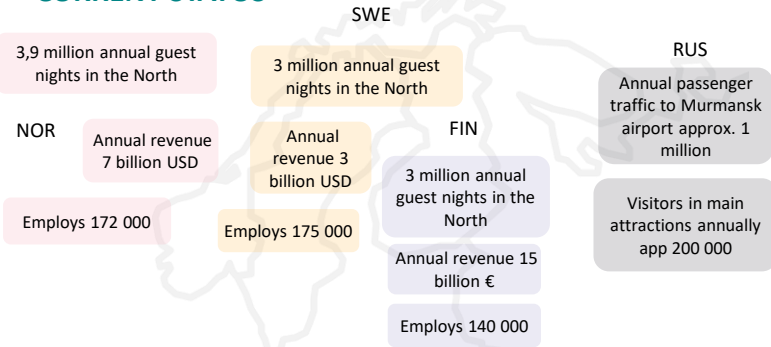
# INDUSTRY TRENDS

## The Outlook of Tourism

### MOST IMPORTANT TRENDS AFFECTING FUTURE DEVELOPMENT



### CURRENT STATUS



### TOURISM INDUSTRY TODAY

- Tourism is an important part of economy and its development especially in the Northern parts of the Barents Region and it is in strong growth currently.
- The uniqueness of the Northern nature, security and snow-proof attract visitors especially to all the three Nordic countries.
- Russian tourism infrastructure is not developed, and the volumes are significantly lower compared to the other countries in the Barents Region.
- The main restrictive factor is accessibility meaning the visa process needed, but also lack of investments in the infrastructure in general. In all parts of the Arctic, limited access to transportation, special climatic conditions and seasonality limit the tourism from its full potential.

### THREATS

- Maintaining the fragile environment in a sustainable way.
- Conflicting interests that different parties have for the region – possible conflicts between mining companies, tourism and indigenous people are a threat for the overall development.
- Flight shaming and the need to decrease emissions might impact the tourism volumes in the long term, effects of current corona virus outbreak unsure.

### OPPORTUNITIES

- Global warming pushes more tourists to the region in the mid-long term. The area still has snow in the wintertime, yet during summertime it is cooler compared to Southern Europe.
- Cooperation with the countries is increasing, e.g. shared travel packages.
- Security of the area and the Nordic countries will increase the attractiveness of the area as a destination.

### IMPACT IN THE AREA

#### THE ECONOMY



Strong impact to local economies that is expected to grow. Tourism growth increases the income of local people and enables them to stay in the area and by that creates wealth and demand for other services, too.

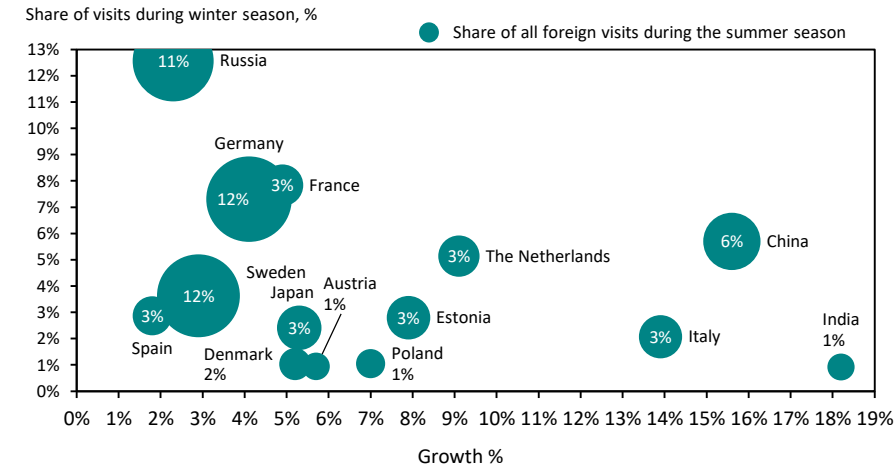
#### LOGISTICS



The growing tourist masses need transportation. In order to reach Barents Region's full synergy potential, tourism flows will require more east-west transportation infrastructure.

### EMERGING SIGNALS AND INDUSTRY TRENDS

#### Top 15 growing target markets in summer season for Finland

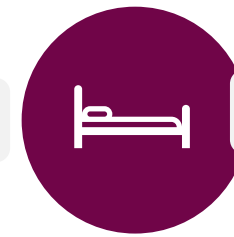


Summer season is growing for tourism. Total season growth in Finland 2019 was 5 %, majority of growth was from Southern Europe and Asia.

#### Alternative accommodation industry is booming



80 million Airbnb guest arrivals worldwide 2016



164,3 million Airbnb guest arrivals worldwide 2018

The amount of overnight stays in Airbnb accommodation is not visible in the official tourism statistics, yet the impact in the area is growing in significance.



## 4.2 Other trends affecting future transportation and logistics

## INTELLIGENT TRANSPORT SYSTEM (ITS)

Barents region of Scandinavian countries is in good position to leverage the benefits of ITS

### The basics

ITS helps to optimize the usage of infrastructure and vehicles through ICT technologies. Through optimization, accidents are reduced, emission levels decreased, transportation time reduced, and better service level offered.

As the price of ICT is diminishing; establishment and adoption of common legislation, standards and specifications are implemented, best practices are derived from pilot projects funded by TEN-T and CEF and ITS services and deployed commercially, the Barents region transport system efficiency is greatly improved in 2020s and 2030s.

### The requirements

ITS relies on **network connections** enabling rapid data transfer between transport and logistics clients, operators, officials and service producers. 4G networks provide already low latency, high capacity and stable conditions for integrated transport operations under which transport, data is exploited in real time.

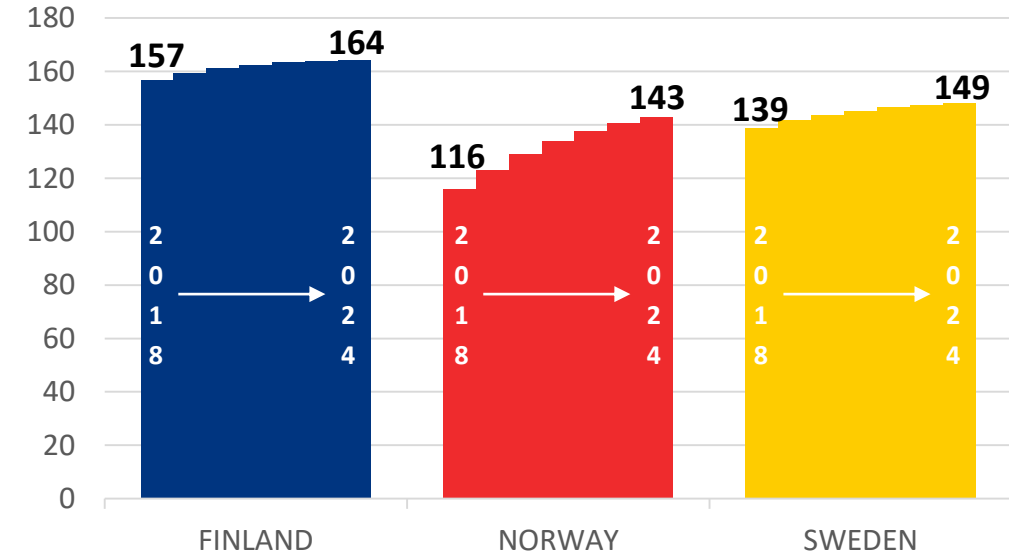
**Autonomous vehicles** enabling quantum leap in transport efficiency require **5G networks**. As Russia has reserved key 5G frequencies for military and intelligence services, cross-border cooperation in 5G development faces challenges. Largest potential of autonomous vehicles comes from public transport and commercial vehicles of which public transport is limited in Barents region. **5G connected vehicles** (such as BMW iNext SUV) come to the market from 2021 onwards and more than 50 % of IoT data transmitted over 5G will come from automotive applications by 2023. European Datex II standard allows efficient sharing of traffic information across borders.

### Effects and possibilities of ITS development at Barents region

- ITS provides cost saving measures in transport infrastructure maintenance and development if connected vehicle are leveraged.
- More effective transport chains and alternative options for private vehicles emerge in 2030s as the supporting infrastructure and regulation for autonomous and connected vehicles is in place.
- Swedish transport administration and Norwegian public roads administration have already cooperated on Datex II implementation. More in-depth, cross-border and business-oriented cooperation and especially pilots are needed to ensure that Barents regions does not miss the ITS development.
- 5G technologies bringing faster internet connections, along with enabling autonomous and connected vehicles, require new investments to 5G infrastructure.



Estimated number of active mobile broadband connections per 100 inhabitants



According to Scandinavian teleoperator DNA, by 2025 half of consumers can use 5G services.

However, most of these consumers are in large cities where 5G infrastructure investments are made. Supporting infrastructure is expensive and comes atop of the 4G network upgrades, that are required to cope with growing demand.

## SUSTAINABLE ENERGY INFRASTRUCTURE OF LOGISTICS AND MOBILITY

Scandinavian countries are committed to CO<sub>2</sub> neutral logistics and mobility in the 2030s - this requires large investments especially to EV charging

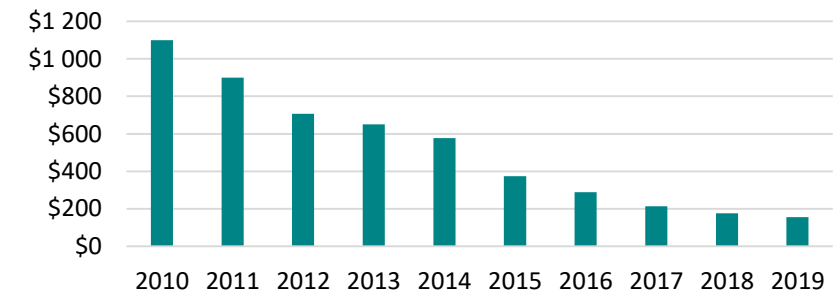
### Contributing factors

- Sweden has adopted a national goal to decrease CO<sub>2</sub> emissions from domestic transport by at least 70 % by 2030, compared with 2010. Finland needs to reduce transport CO<sub>2</sub> emissions by at least 50 % by 2030 compared to 2005 and Norway has a target of 50 % reduction from 2005 to 2030. The Russian reductions from 2015 until 2030 are expected to be counted in few percentages.
- Norway and Sweden are pushing forward with electrification of whole transport system whereas in Finland other alternatives are also sought after.
- By 2040 most cars in Barents region, except Russian part, are electric, either pure battery electric or hydrogen. Long range and heavy-duty trucks use hydrogen and delivery trucks and vans are electric. Biodiesel's role is shifting from cars to trucks in 2020s and to aviation biofuel production in 2030s. Electric aviation gains hold already in the last years of 2020s. Short distance waterways are also electrified.

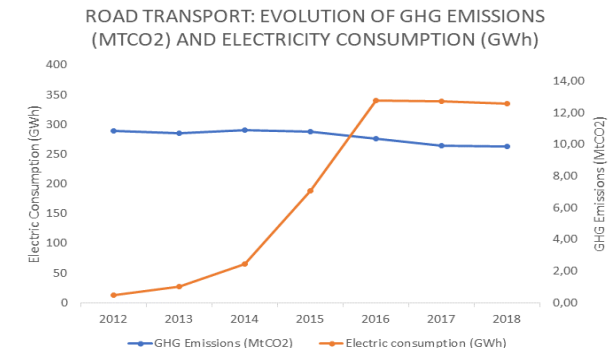
### Effects on Barents region competitiveness

- CNG/LNG and CBG/LBG in road transport present stopgap solutions that fade out in 2030s. Instead CBG/LBG should be guided towards marine vessels and heavy-duty vehicles, which shall run on hydrogen in 2030s.
- Wide scale transport electrification lowers transport and logistics costs while simultaneously reducing CO<sub>2</sub> emissions and local pollution. Combination of ITS services (including autonomous vehicle technology) and electrification enables lowering of transport unit costs by more than 50 % by 2040.
- In order to ensure efficient cross border mobility and logistics, joint charging infrastructure (including heavy duty and bus charging and hydrogen station) development plans need to be introduced.

Battery is responsible for 30-45 % of EV price. During the last 9 years the average price of battery pack has dropped by 85 % and at the same time lithium-ion battery cell densities have almost tripled. Price of battery packs is expected to reach the magical level of 100\$/kWh by 2023.



Norway has made good use of electric vehicle development – road transport emissions have fallen more than 8 % since 2015 even though volume of private road traffic rose by 1,1 %.



## GREEN TRANSPORT

Green transport has several dimensions to freight transport systems in addition to renewable energy questions



**Technological development in transport equipment** in all the transport modes: fuel consumption, dimensions, powertrain, emissions and noise.



**HCT (High Capacity Transport) as a border-crossing transport solution in the High North.** This would need more detailed examination and further development to find border-crossing solutions to maximize payload of transport equipment and to minimize emissions per transported tons.



**Increase of payload** in all the transport modes, increased capacity of transport equipment and utilization of maximum capacity of the transport units.



**Multimodality** – utilisation and combination of the most cost and energy efficient features of diverse transport modes in the most efficient way to constitute optimal transport chains. Also flexibility by using transport units (eg. containers), which are suitable for all the transport modes and also possible to automate terminal handling.



## GLOBAL WARMING

The Barents Region is a Hot Spot for Global Warming, which causes direct impact to both the environment and business in the area

*The Barents Region is unique compared to other arctic regions: it has a developed infrastructure and developed industries; it is densely populated and multicultural. The cumulative impacts of environmental and climatic changes will strongly affect the region in the years to come.*

### **The temperature is rising already**

The climate change affects the Barents Region in a variety of ways. The changes in average and extreme air temperature and precipitation, sea temperature, sea level, snow and ice cover both on land and at sea shape the future of the area. The trends affect terrestrial, freshwater and marine ecosystems, peoples and societies, economic activities and possibilities.

The Barents Region is warming faster than the global average – fast even compared to other Arctic areas. A mid-range scenario for emission growth (RCP4,5) predicts the average winter temperatures to rise by 3–10°C between 2010 and 2080, and by up to 20°C by the end of the century.

Already between 1981-2012 the average temperature has increased 0,1-0,4 degrees per decade. The warming has already had direct impacts on different ecosystems. Increased risk of different natural hazards – storms, extreme wave heights, icebergs, avalanches – are also linked to warming.

**The speed of the development depends on the success of limiting the greenhouse gas production globally.**

### THE IMPACTS TO BUSINESS ARE DIRECTLY LINKED TO THE IMPACTS ON ENVIRONMENT



#### **NORTHERN SEA PASSAGE WILL REMAIN OPEN**

The Barents Sea is expected to be the first area without ice during wintertime in the Northern Sea. This will mean that the Northern Sea Passage would be open for transportation all year long.



#### **GROWING RAINFALL AND EXTREME WEATHER CONDITIONS**

The rainfall is expected to grow, which further will increase snow and ice melting. Extreme weather conditions are expected to increase, which will directly influence all industries operating at the sea and in the coastal areas.



#### **ECOSYSTEM SERVICES FOR PROTECTION**

In order to protect the habitats and species in the freshwaters and wetlands new ecosystem services will be needed e.g. to permafrost maintenance, water regulation and filtration and greenhouse gas storage. Snowmelt and spring flooding occur earlier and ice formation on waterways is shifting and causing affects to reindeer movements.



#### **NEW TOURISM NEEDS**

Compared to central Europe, the temperature will remain cool and attract new kinds of tourist flows. In the long term, the temperature rise will, however, threaten the snow-proof winter season.



#### **LONGER GROWING PERIOD AND NEW SPECIES**

Warmer temperatures will lengthen the growing season. This will support the primary production and forestry in the area. Warmer temperature will also attract new species and diseases that might threaten the harvests. Already now the shifts of the vegetation zones have decreased the mosses and lichens declining. The spread of invasive species is expected to increase.

## POSSIBILITIES AND OBSTACLES FOR CROSS-BORDER CO-OPERATION

Finland, Norway, Russia and Sweden are all ranked rather high in global competitiveness and further investments expected – but times are getting even more uncertain

### *Barents region is at the crossroads of different trade areas*

- In addition to being part of the world market with its rich natural resources, Finland, Norway, Russia and Sweden are each other's main trading partners.
  - For example, Norway is Sweden's 2<sup>nd</sup> main export partner, Finland 3<sup>rd</sup>. Similarly, from Finland, 10 % of total exports go to Sweden, and 6 % to Russia.
  - There have even been some suggestions of free trade agreements in the arctic area some years back.
- In a 2017 study, it was researched that the barriers to commercial exploitation of the arctic capabilities are largely the same as in any other business.
  - There should be politically a selection of a few key areas and targeted investment in their development, partly through new forms of performance-based and ecosystem funding – "Smart specialisation" should take place.
  - Current economic cooperation is affected by the Russian Economic sanctions, which are so far decided at least until September 2020, but expectedly also after this. In addition to EU, also the US has set sanctions against Russia including bans and sector-specific sanctions.
  - As a counter-action, the Russian ban of importing food products into the country continues for the US and EU countries as well as Canada, Australia and Norway.
- The use of the arctic area as a tool in the geopolitics and intensification of the power struggle between superpowers is increasingly visible. The many cooperation institutions in the area have an even increasing role in the future.

### *In the future, some of the interesting things to keep in mind include:*



*Funding for arctic cooperation projects is likely to decline somewhat in now discussed EU budget frame, how much will it affect?*



*New global trust towards markets is needed after the corona virus. How fast will the recovery be?*



*Russia has a completely different energy strategy than the European countries, but the arctic area has been branded the most open area to new.*

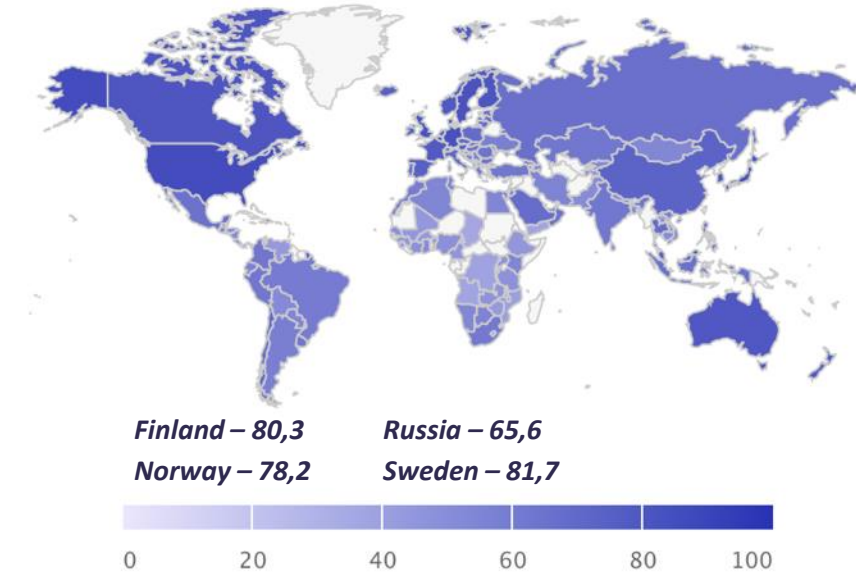


*Current sanctions and policies steer certain actions to take place locally in Russia.*

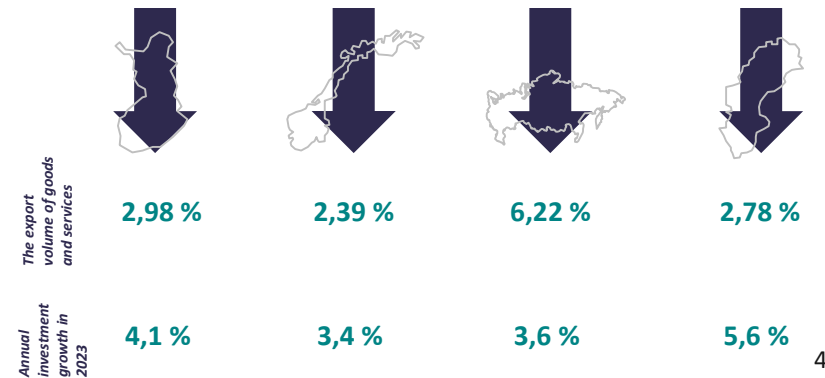


*China is increasingly interested in investing to the arctic area and has already e.g. set up its own tourism resorts here. What are the motives for China?*

### Global competitiveness index



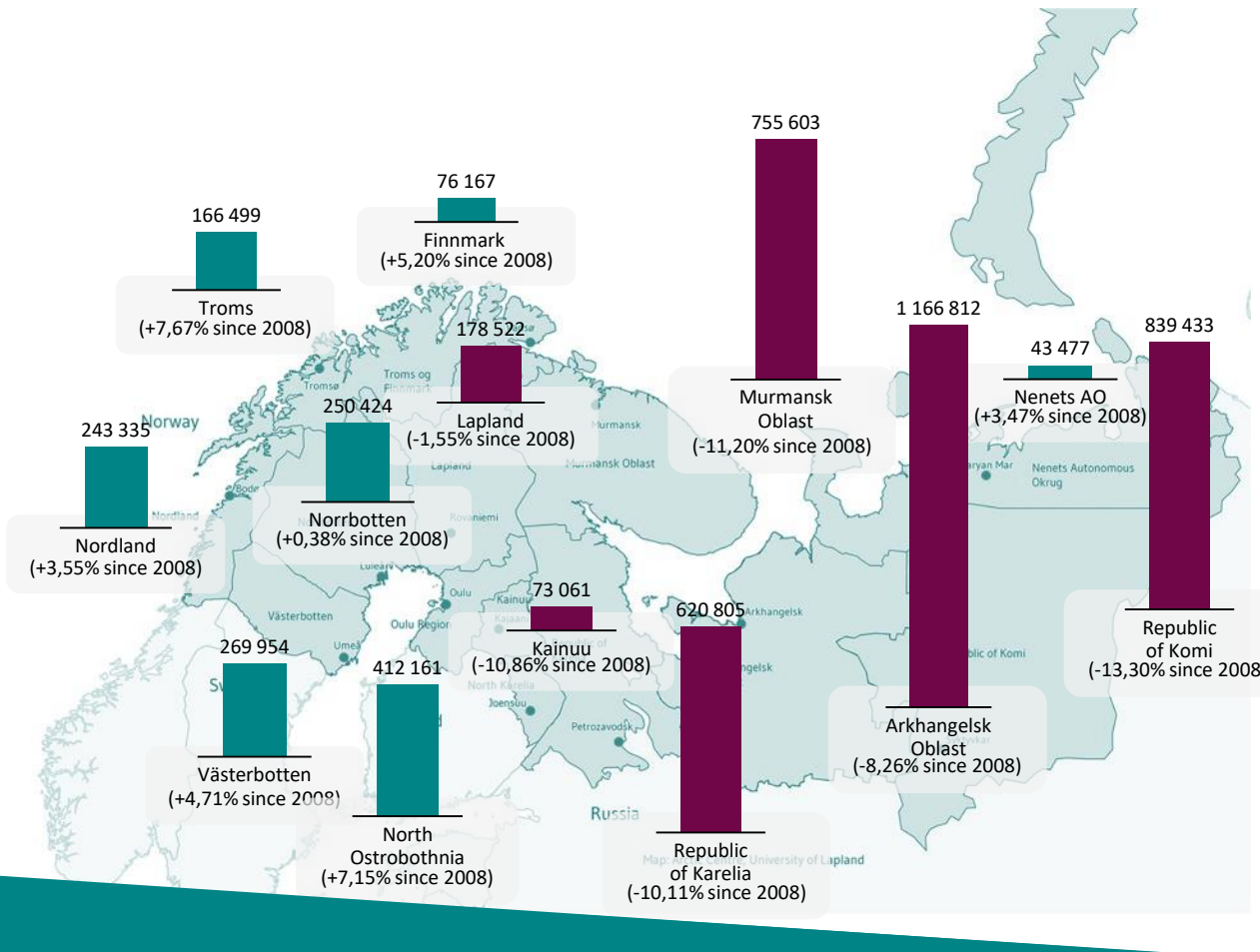
### By 2023...



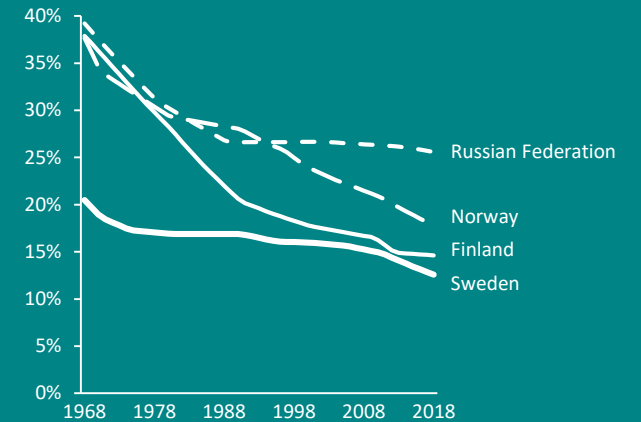
## POPULATION TRENDS

Population in the area is moving to cities and getting older – especially the Russian part of Barents are is losing inhabitants – where can we find future talents?

### TOTAL POPULATION IN THE BARENTS REGION IS 5,1 MILLION (2018)



### Rural population (% of total population)



- Total population of the area is 5,1 million (2018) and the trend is decreasing. The decrease is mainly due to emigration to big cities in Russia outside the Barents Region.
- In the Norwegian part, population has grown during the last ten years by 5 %, in the Swedish part almost 2 %. The population in the Finnish Barents Region regions has remained at the same level.
- The population concentrates more to urban areas in all countries. At country-level, population growth is expected to slow down in all of four countries due to decreasing birth rates. Especially in the Barents Region the birth rates are decreasing. Immigration has supported the overall population growth especially in the Swedish regions inside Barents Region.
- One of the main characteristics of the Barents Region compared to other regions in the four countries is the indigenous peoples living in the area. There are 85 000 Sami inhabitants living in Sápmi, the traditional area of the Sami people, that comprises parts of Norway, Sweden, Finland and Russia. Around 7 000 Nenets live in the Nenets Autonomous Okrug, Russia, and approximately 6 000 Vepsians in the Republic of Karelia.

## COVID-19 TRENDS

At the moment the immediate operating environment is in a big change – the corona crisis has accelerated many trends already now



### 1 RISK MANAGEMENT IS A NEW MANTRA

Companies are preparing for breaks in all operations. Supply chains are being rethought, some outsourcing is being restored, the operations of organizations are being simplified and the flow of information is being streamlined.



### 2 DISTANCE IS THE NEW NORMAL

Physical distance between people remains a part of everyday life and digitality replaces intimacy. Remote work will become the dominant operating model, and related technology with peripherals as well as management models will evolve rapidly.



### 3 CONSUMER BEHAVIOR IS PERMANENTLY CHANGING

The structure of consumption is changing and e-commerce will become the leading distribution channel in all sectors. Uncertainty regarding health and the economic situation overshadow the development for a long time.



### 4 UTILIZATION OF TECHNOLOGY AND DIGITALIZATION IS ACCELERATING

Compared to previous forecasts, the investments will increase significantly. The productivity growth and new business in these sectors is expected to compensate the downfall.



### 5 CASH IS KING

Funding becomes scarce and it restricts growth. The basics of corporate value creation is changing. Exports of capital goods may become more difficult into some markets due to customers' financing challenges.



### 6 FINLAND IS STRUGGLING AMID GROWING BORDERS AND WALLS

Permanent national border formalities will be established, and passenger traffic will be restricted. Geo-economy is rising, protectionism is increasing and international trade is slowing down.



### 7 DEMOCRACY WILL BE REDEFINED BY VOTING

Democracy changes its form by the free will of people. Individual freedom is made narrower and digital surveillance is increased. Security becomes the number one priority. The functionality of solutions displaces ideology



### 8 THE INDEBTED STATE IS TIGHTENING ITS GRIP

The role of the state in the economy will grow. The tax base will expand, and taxation will tighten. Public welfare services will be significantly reduced, but the number of remote services will increase in the entire social services sector.



### 9 HOUSING WILL CHANGE WITH SOCIETY

Remote work and e-commerce will be considered in the housing design phase. Vertical cultivation will be introduced into the living environment. The demand for holiday homes will grow and they will also be designed for remote working.



### 10 SCIENCE AND EDUCATION ARE IN THE CROSS WAVE

The costs of teaching have to be cut and productivity is sought from digitalization and the web. The value of science in discussion and decision-making is growing. Applied cutting-edge research is increasingly dependent on corporate funding.



### 11 HEALTHCARE WILL BE RETHOUGHT

The role of healthcare is growing significantly in national risk management and security of supply. The state takes a firm stance in the direction of private health care and imposes new responsibilities on it. The national social and health care reform will be rethought again.



### 12 NEW GOALS AND RULES OF THE GAME FOR THE FIGHT AGAINST CLIMATE CHANGE

Emissions reductions for companies must be economically sensible, but low oil prices make development difficult. New breakthroughs in technology are expected.

# 5 Scenarios of the future

## PREWORD

Futures scenarios help to imagine the plausible futures beyond the immediate changes

## TOOLS TO PREPARE FOR THE FUTURE

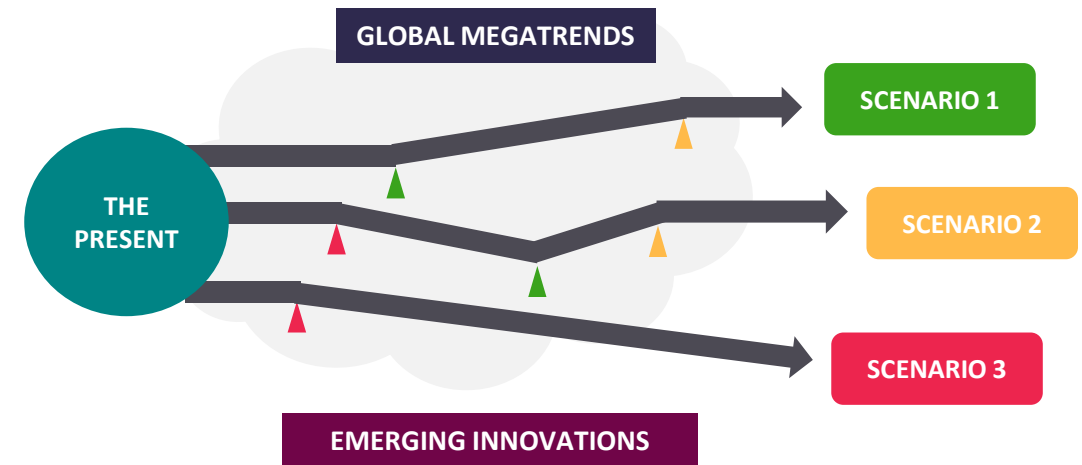
The scenarios can be used as a tool to better prepare for the future, yet should not be used as direct predictions of what is expected to happen. The scenarios can partly co-emerge – yet unpredictable development paths can always occur.

## RESULT OF COLLABORATION

The scenarios presented next are result of an iterative process of approximately 30 professionals within the Barents Region.

## BARENTS REGION COMPETITIVENESS IN FOCUS

Each scenario has its own special features, but all of them are viewed from the Barents Region's perspective. The three scenarios created in this report vary in desirability, but as a whole try to grasp the possible competitiveness of the Barents Region in the World Logistics and Transportation Market in the future.



## 5.1 Three scenarios of future



## SCENARIOS

Three scenarios were identified for the year 2040 in the Barents Region

### SCENARIO 1



#### PROTECTIVE AND COMPANY-DRIVEN BARENTS REGION

##### The main drivers

-  The global warming is hitting hard
-  Protectionism is here to stay
-  Small role for the public sector
-  Business first - mentality
-  Polarizing areas and sectors

### SCENARIO 2



#### SECURITY-CONSCIOUS ONLINE SOCIETY

##### The main drivers






-  Everything is online
-  Precautions are taken
-  Growth of suburban areas
-  International from home
-  Modern public organizations

### SCENARIO 3



#### LEADING ZERO-CARBON TRANSPORTATION HUB

##### The main drivers

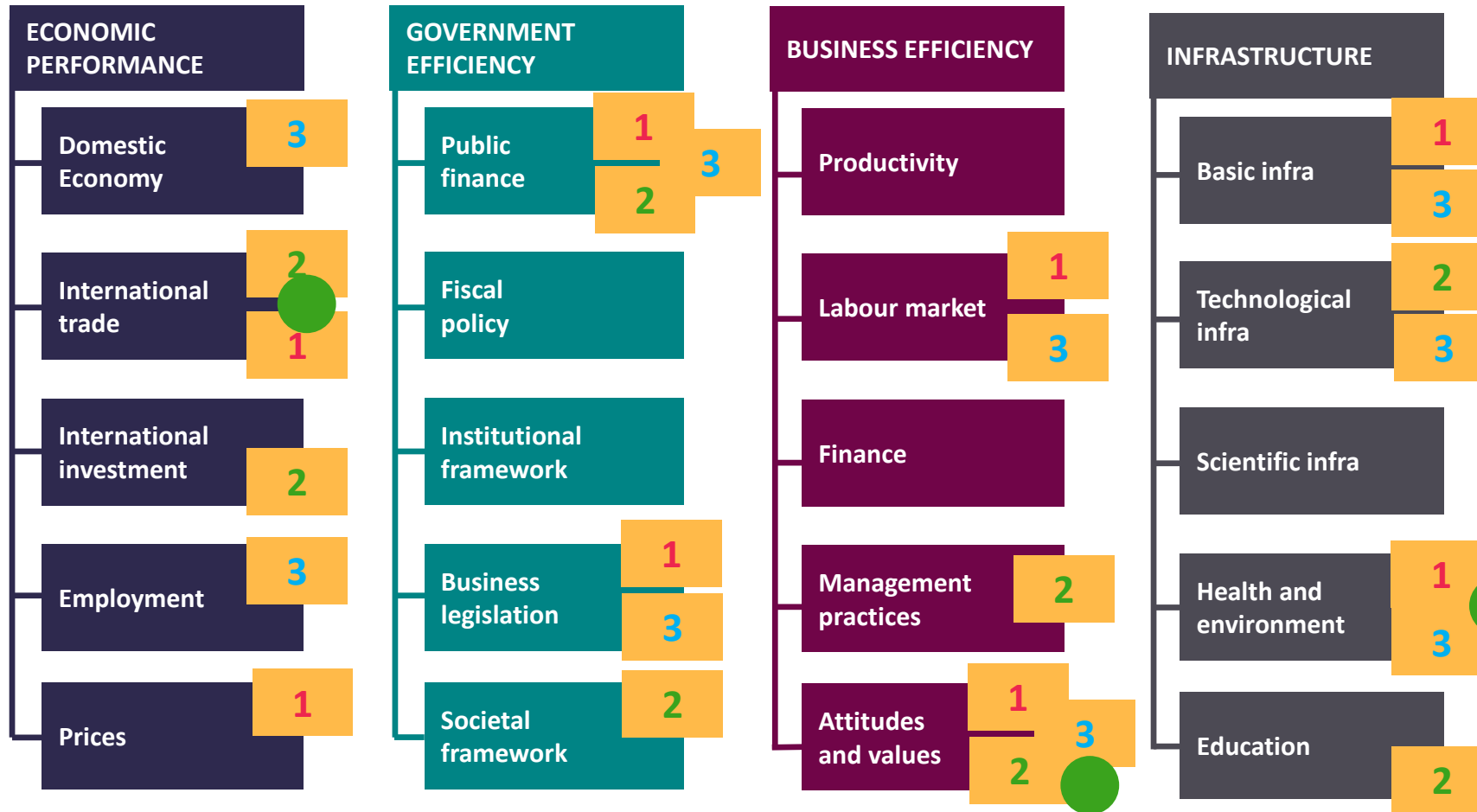
-  Booming logistics industry
-  Zero-carbon is fundamental
-  Immigration as an asset
-  Active collaboration
-  Experiences from nature



# Barents Region COMPETITIVENES IN THE DIFFERENT SCENARIOS

Different scenarios highlight the need for different factors of competitiveness

Factors of competitiveness



## Different scenarios imply different core competitiveness factors

- For the Barents Region to remain competitive in the world market moving towards the 2030s and 2040s, different factors become crucial depending on the scenario of future.
- One way to structure and analyse the different aspects is through the framework of the breakdown of competitiveness factors, where competitiveness is divided into four different main performance categories and their sub-categories, as showcased on the left-hand side.
- In the upcoming scenario pages, the most crucial “must win battle” competitive factors have been highlighted for each scenario.
- When compared to current state of Barents region, conclusions can be made on the Barents future competitiveness.

**1** Factors of competitiveness highlighted by the first scenario

**2** Factors of competitiveness highlighted by the second scenario

**3** Factors of competitiveness highlighted by the third scenario

**●** Factors of competitiveness traditionally strong in the Barents area

Sources: Balkytė, Audrone and Tvaronavičienė, Manuela (2014). Composing Sustainable Competitiveness Index: Practice And Discussions. 8th International Scientific Conference “Business and Management 2014” May 15–16, 2014, Vilnius, LITHUANIA.



## 5.2 Closer look to Scenario 1

## SCENARIO 1

### The key characteristics of the scenario



#### PROTECTIVE AND COMPANY-DRIVEN BARENTS REGION



##### GLOBAL WARMING IS HITTING HARD

For several reasons, the measures towards the climate change haven't been sufficient and the Barents Region is facing severe problems in tackling with the new situation. The temperature has risen, and this has caused multiple effects to the businesses and individuals in the area.



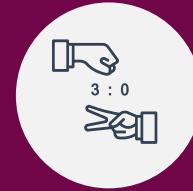
##### PROTECTIONISM IS HERE TO STAY

There is no joint Barents Region mentality and the cross-border collaboration lies in the hands of individual companies. Overall protectionism has pushed the countries to focus on their comparative advantages. The significance of EU has decreased.



##### POOR AND SMALL PUBLIC SECTOR

The focus of government-level development has been in the growth centers and this has resulted in big cuts of the regional budgets. The public sector hasn't had the possibilities to invest to regional development and is strongly depending on businesses.



##### BUSINESS FIRST – MENTALITY

As the global markets for different raw materials produced in the Barents Region have grown, the companies have big power over the development of the areas. Business needs are seen primal. Due to international pressure and to find suitable staff, many companies also provide education.



##### POLARIZING AREAS AND SECTORS

People are concentrated in the growth centers and big areas in the Barents Region are left uninhabitable. The tourism is growing in Lapland, yet more and more of companies in areas without snow-proof are losing their businesses. Investments are accelerating the polarization.

## SCENARIO 1

In 2040 companies are utilizing the vast resources of the area – yet only from areas where it is cost-efficient

*In 2040, the impacts of global warming are clearly visible in the Barents Region. The actions taken to prevent the warming have not been sufficient. Now, the industries operating in the area need to deal with the current situation, as the area isn't in the interests of government-level decision-makers and the governments implement protectionistic measurements.*

### Post-corona reaction

The focus has been on economic recovery without considering the long-term impact of the investments made. Also, the biggest efforts are directed to areas that were most growing already before the crisis, which has left the rural areas out of focus. On the other hand, as protectionism has grown in the EU-level and companies have invested highly to relocating their production and raw material production closer, this has enabled the grown interest towards the resources located in the Barents Region.

### Environment

The effects of climate change are challenging the companies using the natural resources. Big rainfalls tease the mines, new species damage forests and the snow-proof areas are moving higher north.

There has been no systematic precaution to the effects of climate change in addition to the prevailing over-optimism regarding the situation to resolve itself. The result is the realization of the negative causes of the climate change and the Barents region being left behind in development.

### Demographic development

The population has decreased significantly. In some key areas companies have taken greater responsibility for attracting new residents, which has helped the situation somewhat, yet not entirely. Most companies find the lack of suitable employees as a barrier to invest to the area. Due to global warming, big refugee masses became frequent in the 2030s, which caused opposition among the locals in the region.

### Accessibility and infrastructure

Due to protectionist movements, EU has lost a big part of its funding and possibilities to invest in the regional development. The main transport routes have been improved by company investments to ensure required road and rail transportation to the big hubs in Europe from the Scandinavian part of the Barents Region. Many areas have, however, been left out from the infrastructural development. The basic infra needs improvement and maintenance, there are no individuals living close by - and this has created a situation that is too risky and investment heavy for it to be profitable.

There have been only some investments to the data communication infrastructure funded mainly by companies, but that has benefitted only a few areas. The Northeast Passage as a route has not been realized as expected, as there is no international will to invest and use the Arctic route due to risks and protectionist attitudes. Instead, the goods between Europe and Asia are transported through the big European hubs.

PROTECTIVE  
AND COMPANY-  
DRIVEN REGION



GLOBAL  
WARMING IS  
HITTING HARD



PROTECTIO-  
NISM IS HERE  
TO STAY



POOR AND  
SMALL PUBLIC  
SECTOR



BUSINESS  
FIRST –  
MENTALITY



POLARIZING  
AREAS AND  
SECTORS

## SCENARIO 1

# Tourism to Lapland is growing, but many areas in the Barents region suffer

### Barents regional collaboration

There is protectionism in power, the governments in the area take care of their own issues and are not interested in collaboration in the Barents region - it is seen as a memory from the past. Also, as EU funding decreased significantly, there less possibilities to support the regional development and collaboration. However, companies cooperate within industries despite land borders, which supports the development of the region's infrastructure.

### The role of public sector

The public sector has been drastically cut and responsibilities transferred to the provinces. Above all, the Barents region is seen through the interests of the businesses – yet the vast resources are recognized by the governments. The national investments have been put to the development of urban areas and businesses having the biggest future impact, and as a result big areas in the Barents region are almost empty.

### Tourism

Polarized tourism is characteristic for the Barents Region. Lapland in Finland, Norway and Sweden attract big climate tourist masses from Southern Europe and have replaced former big tourist locations such as Rome and Venice among the wealthy consumers. Overall the levels of international tourism have decreased since the time before corona crisis, but that isn't seen in Lapland. In other areas of the Barents Region, tourism has decreased significantly. The levels increased for some years among the national tourists, but as the public investments have decreased, the economic reality in the regions has caused service level to go down. Travelling to Russia is rare due to the country's strict visa policies and lack of interest in attracting the wide masses to the area.

### Other key businesses

All of the Barents Region countries are in general supporting their national industries and interested in the growth of these sectors. This is result of highly protectionist politics globally, which led to increase in prices and forced countries to concentrate on their comparative advantages. In the case of the Barents Region this meant focus in bioeconomy and forestry, metal mining, blue economy and tourism.

The overall operating environment for different businesses is challenging. The border controls are strict, and a lot lies in the hands of the companies from infrastructure maintenance to attracting suitable working staff to the area.

Minerals are mined from the Barents region to Central Europe to be used in various products utilizing the latest technologies. As the European countries cannot produce such raw materials themselves and prefer sourcing close-by, there is growing interest towards the usage of resources in the Barents region. Poor basic infra outside of the current production facilities and lack of investment capabilities from the governments and local authorities is highly restricting the growth potential.

Vast areas in the Barents Region became empty in the 2030s, but by 2040 due to well-developed energy storage and smart-grid systems, the areas are used as wind parks in which 0-priced electricity is used to produce e-fuels that are sold to other parts the Europe. Oil and gas industries slowly decrease. Energy usage of wood has increased significantly in Russia.



## SCENARIO 1

Mass tourism drives the locals away from the before-quiet recreation locations, and big rainfalls are typical, but companies offer the basic living conditions for all



### ONNI

*An ordinary citizen of the scenario*

Onni, 25, lives in a small town in the Northern Finland with a friend. He moved to the area from the capital region with only comprehensive school education five years ago in need for money and new experiences.

Works in a mineral mine of a large fertilized company. Onni and his friend found the position through a big recruitment campaign in an online video game portal. The company first gave them three-year long basic education degree for free while working and is providing them housing and double the pay their friends are getting back home. They have a binding agreement to work for the mine until the end of 2050.

During his freetime, Onni and his friend visit the bars in the nearest tourist attraction center UKK National Park. There area a lot of activities and things to do and see. However, they prefer doing it on weekdays as the weekends and holiday seasons area so crowded. Especially the Italians travelling away from the heat during summertime annoy Onni a lot.

Onni has never been abroad – outside of one or two visits to Tallinn - as it is so expensive nowadays. He dreams of a trip to Shanghai after his employment period at the company has ended before moving back southbound.



### MULTICON

*A typical company of the scenario*

Large mine producing minerals to be used in batteries and industrial applications. Enrichment facilities and other facilities of battery production value chain are adjacent to the mine providing employment opportunities for thousands of people.

Benefitted from lax environmental regulation of the 2020s and multimillion support from governments, industrial companies now play key role in the Barents region. Development of the 2020s has given companies more power than before as governments and local authorities are dependent on them to be able to provide labour and education opportunities for Barents region. Even though the countries have low environmental regulation, the company has had to greenwash its activities and compensate the environmental damages by large social responsibility programs.

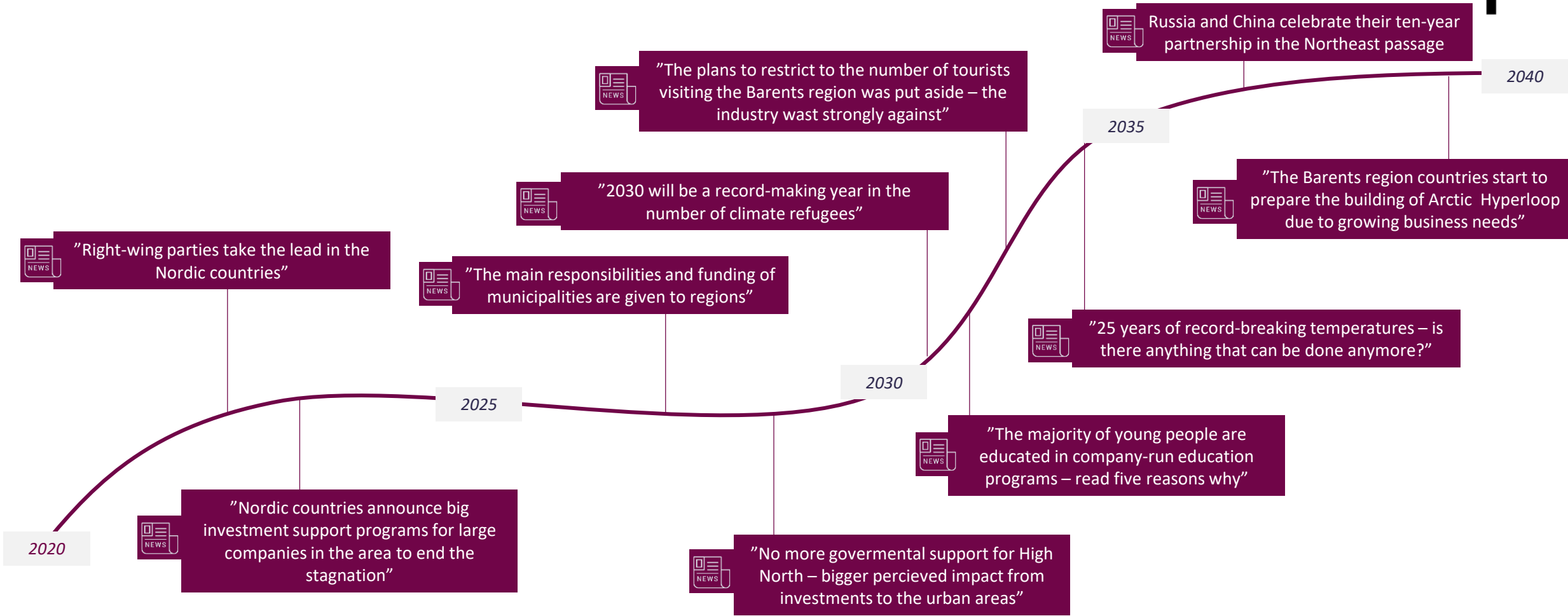
Enriched battery materials are imported by ships to central Europe for battery and vehicle production clusters that partially own the mines and enrichment facilities. Even though climate change was partially neglected in the past, there is now dire need for clean products that require the valuable materials sourced from Barents region.

Climate change has caused increased rainfall that again causes occasional spills in the coagulation basins causing severe local environmental disasters in the surrounding waters.



# SCENARIO 1

## Key events in the timespan in the path to the scenario



**PROTECTIVE AND COMPANY-DRIVEN REGION**



**GLOBAL WARMING IS HITTING HARD**



**PROTECTIONISM IS HERE TO STAY**



**POOR AND SMALL PUBLIC SECTOR**



**BUSINESS FIRST – MENTALITY**

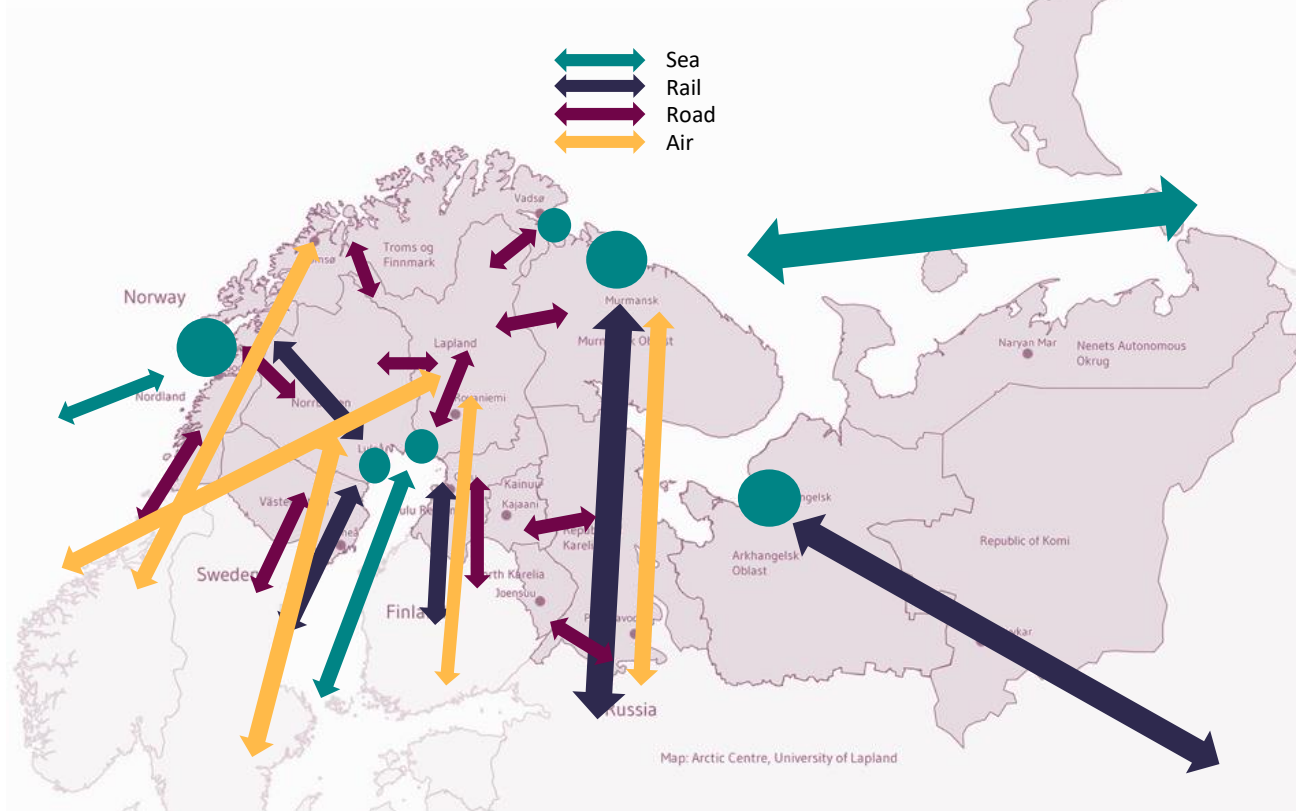


**POLARIZING AREAS AND SECTORS**

## SCENARIO 1

Compared to the current status, the transportation flows increase to Central Europe

### MAIN TRANSPORT DIRECTIONS IN 2040



#### SUMMARY

*The role of the Barents Region in the global transport and logistics market according to the scenario*

The raw materials only Barents Region can offer are mainly transported to Central Europe for processing. Due to strong protectionism, companies want to keep raw material sourcing and final production close to the consumption and governments restrict border-crossing activities and transportation flows.

In terms of the fastest-growing industries, bioeconomy, forestry, mining and tourism are in the lead. The big climate tourist masses to Lapland all-year-long have increased air traffic to the area. In the visitor centers, most of the passenger transport is organized by private operators and as the role of the public sector has decreased overall, no public transportation is provided in the majority of the Barents Region with only few exceptions.

The road network and transportation routes are mainly developed by private investments, as the investment power of the EU has decreased significantly.

The level of marine traffic in the Northeast Passage hasn't met the expectations set for it and is only used in raw material trade between China and Russia. As a result, Russia significantly invests in its own Northern harbours and the amount of good transited to Finland has been in decline.

PROTECTIVE  
AND COMPANY-  
DRIVEN REGION



GLOBAL  
WARMING IS  
HITTING HARD



PROTECTIO-  
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POOR AND  
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SECTOR



BUSINESS  
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MENTALITY



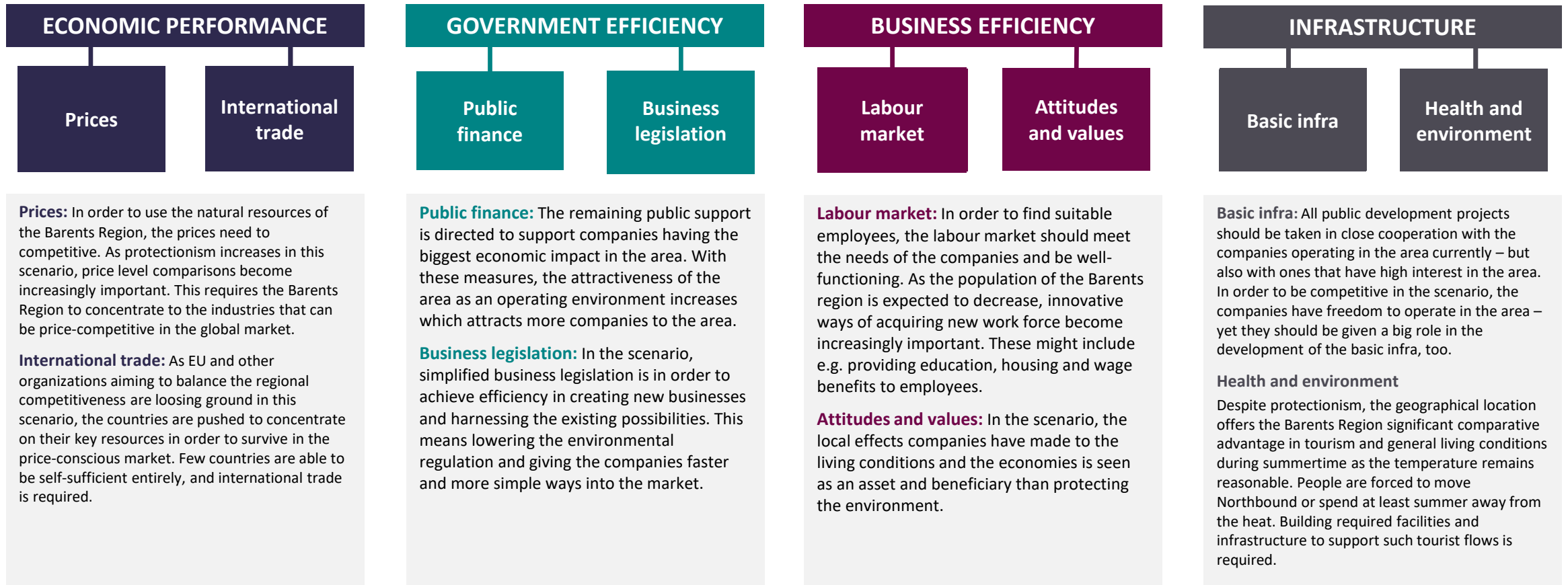
POLARIZING  
AREAS AND  
SECTORS



## BARENTS REGION COMPETITIVENES – SCENARIO 1

For Barents Region to be competitive in this scenario outcome, the focus needs to be put in fostering public-private relationships and giving the companies more power to influence

Most important factors of competitiveness in this scenario:





## 5.3 Closer look to Scenario 2

## SCENARIO 2

### The key characteristics of the scenario



#### SECURITY-CONCIOUS ONLINE SOCIETY



##### EVERYTHING IS ONLINE

Big investments in data infrastructure and network connections have enabled full transformation into a digital Barents region. This has changed the ways of working, consuming and spending free time in the area.



##### PRECAUTIONS ARE TAKEN

Due to the constant outbursts of corona virus, the overall uncertainty over safety and security are dominating. As the effects of global warming haven't been fully avoided, a new threat has risen in the form of constant environmental hazards – and new securing industry has risen.



##### GROWTH OF SUBURBAN AREAS

As the result of the excellent remote working conditions and will to avoid the crowded cities, many people have decided to live in the suburban areas – close to the e-commerce logistics hubs, but also near the nature. For people in the cities, it is typical to co-own summer cottages in the countryside.



##### INTERNATIONAL FROM HOME

Tourism levels have decreased significantly due to fear of different viruses and big masses in the airports, but also thanks to the developed VR and other technology that has enabled visiting anything from home – online. This has opened new possibilities also for individuals willing to offer their own tours in the web.



##### MODERN PUBLIC ORGANIZATIONS

Public sector is a big employer and caretaker yet has also taken most out of the digital possibilities available. In the Nordic countries the municipalities are offering services to all – thanks to the possibilities and cost-efficiency provided by digitalization.

## SCENARIO 2

# Barents Region has benefitted from investments in data networks, but the overall political environment has been unsecure and in constant shift

*In 2040, the effects of climate change are already visible. The worst-case-scenario has been avoided, but still, despite of good intensions, the measures of countries fell short and the change accelerated. By now, the effects are many to both the people and companies operating in it. The Barents region has, however, found considerable possibilities from the data network infrastructure building and this has improved the accessibility of the area remarkably.*

### Post-corona reaction

Over-conscious attitude spread among the people, as the corona and other virus outbreaks became frequent pandemics during the 2020s and 2030s. Individuals realized the possibilities of remote working and from early on big investments were directed to developing telecommunications and data infrastructure. This made it possible not only for white-collar workers to buy new summer houses and use them also outside of the summer season for working, but to create societies functioning completely online. However, the reaction to corona virus mainly took place at the individual level and not at the level of countries, keeping close global collaboration in agenda.

### Environment

Various measures were taken to prevent climate change, but this was not enough. The average temperature has risen over two degrees, which has had multiple effects to the operating environment.

In the Barents region, the effects include frequent fluctuations in weather conditions, yearly temperature rising to a level where snow is not guaranteed every year, summers

being relatively hot, and the increased need for rescue services for events such as avalanches, fires and maritime accidents. The Northern Sea is also open all year long.

### Demographic development

The online and accessible society enables working remotely and many people have found it suitable to live in suburban surroundings. In larger countries, drone-based logistic chains serve people living in the rural areas, as the consumer base is so high, but this isn't the case in the Barents region. Knowledge workers are dual-residents in bigger cities and smaller summer cottages that are typical to be co-owned. Data centers and maintenance work still require some physical travelling, which pushes people living close by. Overall, the population has decreased in the area, yet not so drastically as was thought due to more free working arrangements. Inside the Barents region, however, people are mainly living in the suburban areas.

### Accessibility and infrastructure

Data network investments have significantly improved accessibility, yet physical infrastructure development has concentrated in the most growing regions close to data centers. Due to overall decrease in transportations – people are not interested in travelling in the fear of epidemics in large tourism attractions and cities – the social and virtual accessibility has grown in significance.

The Northeast Passage is in Russia's and China's bilateral use, but apart from that mainly not used. Instead, the Northern Data Cable has brought data traffic to the Barents region and enabled multiple jobs due to the data centers located in the area.



## SCENARIO 2

The new and growing industries are related to data traffic and rescue services – although natural resources are still in use, too

### Barents regional collaboration

Uncertainty has remained high and the situation is changing rapidly. There is will among the regional authorities to collaborate in the Barents region level, but the amount of activities depends on the country and person chairing or whether there is a new pandemic or a cyber attack taking place and complicating the collaboration.

### The role of public sector

Strong regional policy and investment to keep the whole area populated - tax breaks and other benefits will keep the Barents region alive. Public sector services are mainly offered online from healthcare services to education due to growing uncertainty over possible future health pandemics as well as a very developed data traffic infrastructure to allow it. Public sector is a big employer, and compared to other European regions, in lead when it comes to being digitally present in the residents' everyday lives. The online society has also attracted various cyber attacks to both businesses and the public sector. These attacks change form constantly and has also changed the role of government to protect its people from such outbreaks.

### Tourism

Online services and e-tourism have significantly decreased the number of visitors travelling longer. Service offering among these fields, however, has brought new kind of business to the regions. People can sit in their homes and enjoy guided tours online to the most precious locations that otherwise wouldn't be accessible anymore combined with e.g. local foods being delivered to home to complement the package. VR technology has developed in a way to enable even smelling the forest as it is. Some people still enjoy going to the nature and visiting places physically, but closer to their homes.

### Other key businesses

Data centers have created multiple jobs and are attracting supporting companies close by. The centers are self-efficient in terms of energy production and at times sell excessive energy to the grid. As the Northern Sea is open all-year-long, offshore wind power production parks have replaced the oil and gas fields especially in the Scandinavian shore already in the 2030s. Nuclear power is also dominating in the area.

The new securing industry was born from the need to mitigate the safety hazards caused by the fluctuating and extreme weather conditions. The industry is specialized in protecting the cities and other urban areas, business parks and key areas for the society from the damages that might occur. There is also business related to cyber attack prevention and protection.

Sharing economy and freelance entrepreneurship have become a normal part of the society. This means that many of the companies operating in the area are micro-level companies offering their services online. The businesses vary from online tours to foreign tourists to last-mile delivery solutions to the neighbourhood.

E-commerce based retail market has changed the functions of the logistics industry. Warehouses are typically located close to data centers from where the local delivery staff distributes packages. In larger centers, drones are the dominating last-mile-delivery method.



## SCENARIO 2

A typical Barents citizen works remote in a knowledge-intensive job, or locally in the rescue centre, mining sector or public support services such as healthcare and education



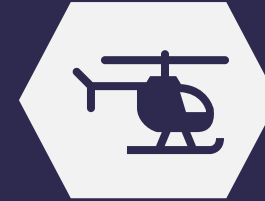
### ANNA *An ordinary citizen of the scenario*

Anna, 44 years, lives with husband and their two children. She is born and raised in the Barents region and cannot imagine living anywhere else; neither can her family.

Anna works for the national ministry remotely from home and visits the capital region, where the office is located, once a month for two days. Anna was educated in a Barents region online university into a profession that requires high level of intellectual skills. Her main working tool is her next decade laptop, through which she does everything.

In her free time, Anna enjoys the nature and her hobbies include e-orienteering, e-skiing and e-trail running with her own VR equipment. While visiting the capital monthly for work with her husband who works for a private software company also headquartered in the capital, they use the time after office for culture. This is also possible as the working hours are short due to high productivity of e-work.

The services she uses in her everyday life are mainly served through the municipality. These services include school and day care for the children, partly online and in small groups to prevent different viruses from spreading. Anna does all her shopping online, but sometimes visits the wholesale facilities when the cyber attacks have closed the online store temporarily.



### RES-CUE *A typical company of the scenario*

A significant new employer in the area is the state rescue services, organized through the government individually in all countries. The need for rescue centres was highlighted by the near accident that took place in the Northern Sea Route at the beginning of 2030s, and the requirement to set up the new organization took place relatively fast. By now, it is one of the largest employers in the area.

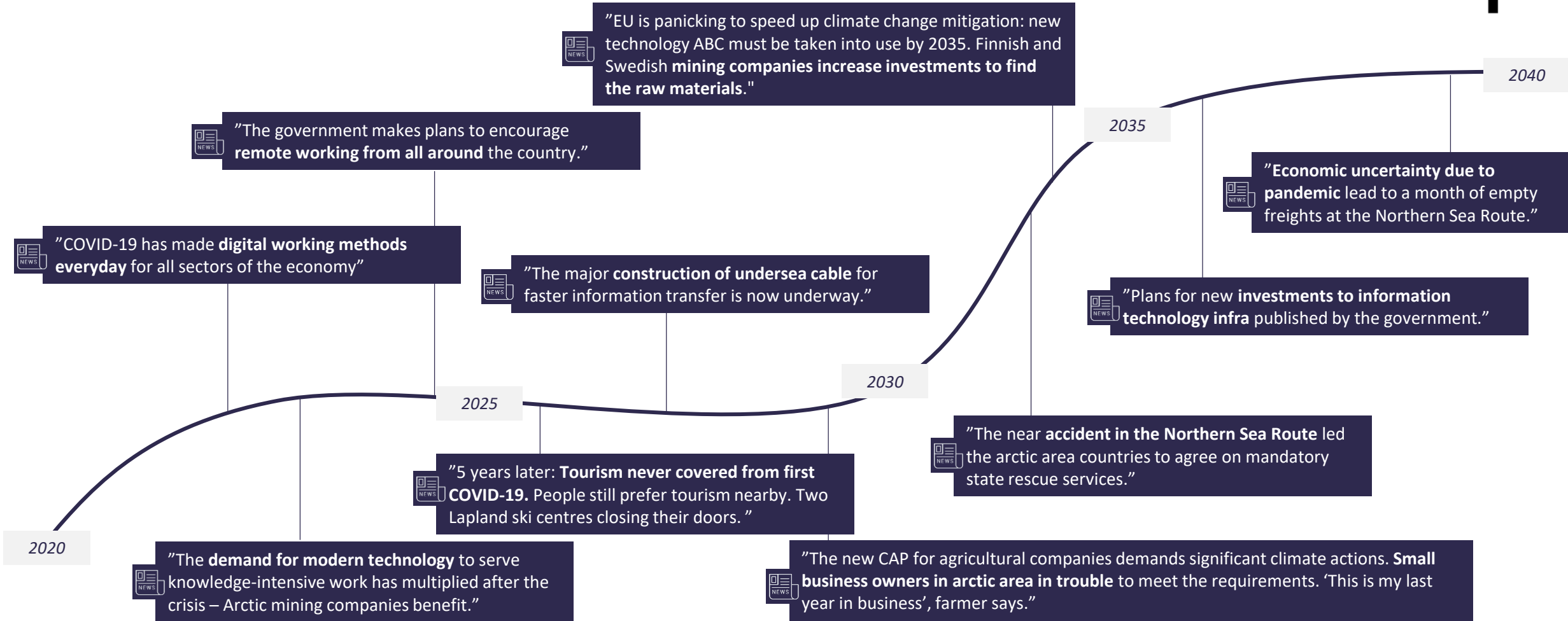
In addition to the Northern Sea Route, rescue services are needed in many areas of the area due to negative effects of climate change. These include preparation services for avalanches in local ski centres mainly used by in-country tourists, and firemen for accidents in the mining sector and fires caused by campers in the increasingly hot and dry summers.

In addition to rescue service professionals such as healthcare and protection personnel, the centre has a large-scale internal data analytics department working in forecasting. The centre uses modern satellite technologies to forecast areas which are likely to meet harsh weather conditions. The centre has also close cooperation with local universities in developing new forecasting methods. The centre also organizes work life education lectures for the students using AR.



## SCENARIO 2

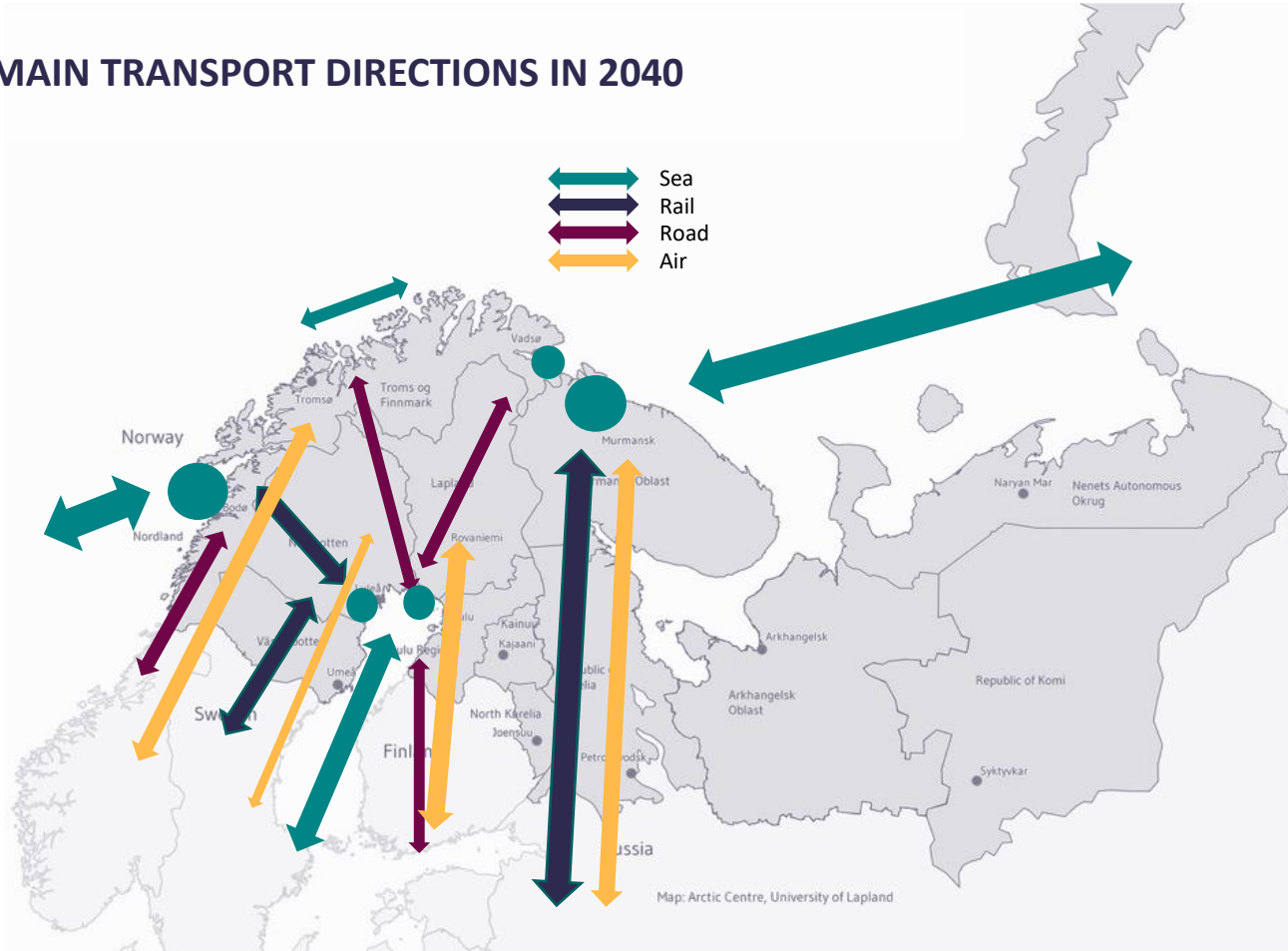
### Key events in the timespan in the path to the scenario



## SCENARIO 2

The scenario signifies change specially to routes where mining and maritime sector products are transported

### MAIN TRANSPORT DIRECTIONS IN 2040



#### SUMMARY

*the role of the Barents Region in the global transport and logistics market according to the scenario*

In this scenario, the role of data traffic grows significantly thanks to the Northern data cable built to the Northern Passage. Other industries remain in the area, and physical transportation flows are in line with the current level. The Barents Region is expected to become an increasingly important business area for the mining and blue economy sectors. Both sectors also serve the global industries in need for minerals as well as consumers all around the world. However, the transportation flows from the area are mainly goods and raw material produced in the Barents region – the goods from other western countries moving to China use other routes. The countries and companies are concerned about the environmental effects of the Northern Sea Route, which haven't been fully mitigated.

On the other hand, because of assumed active climate mitigation actions throughout the 2030s, the losing sectors in this scenario include the gas and energy sectors as well as the bioeconomy. In addition, the structural change of agriculture and reindeer herding economy is expected to continue and therefore significantly diminish in the area. It is also expected that the tourism boom in the arctic areas is going to decline during the 2030s. This means that the passenger traffic of airports declines. Due to remote working and online services, the need to move from one place to another decreases overall. The scenario 2 expects the public sector to take a strong hold in the area in building required service structures for all remotely working people in the knowledge-intensive businesses as well as to employees of the mining and fishing industries. In addition, rescue services take an important role in the Barents region in the future mostly working around e.g. still existing ski centres and the coastal areas.

SECURITY-  
CONCIOUS  
ONLINE SOCIETY



EVERYTHING IS  
ONLINE



PRECAUTION  
S ARE TAKEN



GROWTH OF  
SUBURBAN  
AREAS



INTER-  
NATIONAL  
FROM HOME



MODERN PUBLIC  
ORGANIZATIONS



## BARENTS REGION COMPETITIVENES – SCENARIO 2

For Barents Region to be competitive in this outcome, especially public sector services, international connections and flexible management practices should be developed

Most important factors of competitiveness in this scenario:





## 5.4 Closer look to Scenario 3

## SCENARIO 1

### The key characteristics of the scenario



#### LEADING ZERO-CARBON TRANSPORTATION HUB



##### ZERO-CARBON MOBILITY RULES

Big investments in developing low carbon transportation technologies has resulted to a situation where Barents region is one of the leading hubs of green transportation and mobility. The industry has attracted more investments and all actions are designed to be carbon negative.



##### BOOMING LOGISTICS INDUSTRY

Thanks to the advanced, climate friendly technologies and policies, a large portion of companies want to use the Barents region as the key transit location between Europe and Asia. The greenness has enabled the full utilization of the Northern Sea route and the new Silk road through Russia.



##### IMMIGRANTS ARE AN ASSET

To replace the decreasing population levels, big efforts have been put to attract immigrant workforce to the area. The low carbon mindset has attracted international talent to the technology developing companies in the area – although mainly to the larger cities in the region.



##### ACTIVE COLLABORATION

Thanks to the shared vision to create a world-leading mobility hub, the Barents Region countries have found an active and well-working collaboration with each other – both the Nordic countries and Russia. As the area has also global significance, many people are acknowledging having a “Barents mentality”.



##### EXPERIENCES FROM THE NATURE

As environmental laws are strict, the level of tourists is highly regulated. Tourism is concentrated to specific locations and is especially driven by experience- and extreme tours offered by various companies in different parts of the region.

## SCENARIO 3

# Big investments to building low-carbon transportation infrastructure have made the area attractive to cross-border logistics companies

*In 2040, the Barents Region is one of the leading low-carbon transportation areas in Europe. The countries in the area have invested widely in building low-carbon transportation and supporting infrastructure and the people living in the area are using climate-friendly transportation means (electric vehicles of various forms) as part of their everyday life. The communities and the countries have supported especially immigrants and asylum seekers to move to the Barents Region with significant tax benefits.*

### Post-corona reaction

The focus of the countries was in building environmentally sustainable growth in order to mitigate both the economical stagnation and the climate crisis approaching. Major investments in low-carbon transport infrastructure, wind power and new technologies were made as tools to enable economic recovery. As a result, the synergies between renewable energy, smart grids and e-transport were realized in the area.

### Environment

Thanks to global efforts, the global warming has been kept in 1,5 degrees. This means, that the impacts have been only minor - yet still exist. Environmental issues are in the center of the society's priorities both locally and globally, as the warming still hasn't ended completely.

### Demographic development

The number of immigrants in the region has increased significantly in response to the growing need for work aged residents. People with origins in the Barents region are not as big majority as they used to be, but nobody sees this as a problem. Most people live in the growth centers of the area - the regional capitals and areas close to the logistics hubs. Due to good data infrastructure, most of knowledge-based work is concentrated in the larger cities outside of the Barents region.

### Accessibility and infrastructure

Accessibility has improved, especially between the growth centers in the region. Infrastructure projects (incl. autonomous vehicles and electric airplanes) focused on main roads and cities large enough to support airports. Also, as green transportation has become the key competitive edge for the area in the logistics market, a snowball effect has been created. Especially the border-crossing infrastructure has increased and the logistics hubs area smoothly operating in collaboration.

As the Barents Region is a well-established green logistics hub, also the cost-cutting benefits of the Northern Sea Route have been noticed. Thanks to the big EU Green Deal Investments in the 2020's, a solid foundation was formed to the future development. In addition to the Sea Route, also the Chinese Belt and Road initiative has been built and is in active use. Together with these, also building the TEN-T network to Finland has been a profitable investment. Existing road infrastructure is being strongly developed to support low-carbon transport and logistics while investing in rail infrastructure between countries by projects funded by both the EU and China.



## SCENARIO 3

# The key industries in the area are logistics, low-carbon mobility – but also modern food industries

### Barents Regional collaboration cross-border

Active cooperation is characteristic for the region. This means government-level support for the regions – both in the Nordic countries as well as in Russia. Common goal-setting and shared challenges brought the areas together late 2020s, which has lasted. Protecting the fragile environment yet supporting the growing businesses in the area requires close collaboration and shared decision-making from all countries.

### The role of public sector

Public sector has a strong role in the development of the Barents region. Attracting and integrating immigrants successfully has been one of the key activities of the public sector that has benefitted the entire area.

### Tourism

Tourism in the region is based on sustainable principles and is attractive especially to local people. Some foreign visitors visit the country, yet the number of international tourists is limited due to environmental and health reasons. Tourism is focused in small locations and many local people host their own quests and take them to tours in the nature. Special trips, extreme tourism and experiences are in the rise. The tourism levels have remained the same for many years, but the prices of the experiences are rising.

### Other key industries

Green transport and logistics form the key competitive edge compared to other sourcing locations and transportation routes. This increases the willingness to use the Northern Sea Route – and has also enabled the full potential of the Chinese Silk Road. This means big possibilities for the logistics sector in general. As the green transportation investments and test areas in the late 2020's brought the interest of the international investors and companies, also new logistics companies were attracted to the region.

The fastest growing businesses inside the region are organic and wild food production, where the arctic characteristics are combined with the latest technology. Distributed energy production systems are used. Wind power is the dominating energy production form.

As the area provides challenging climate, favourable regulation and officials along with incentives, new transport technology demonstrations are conducted in the area and novel rural transportation services are in wide scale usage across Scandinavian countries who have been working jointly to develop 5G based transport and ITS services.

The growth of electric vehicles (both in aviation and road vehicles) and other supporting low-carbon technologies, such as almost zero priced electricity, has increased the demand for different minerals, but the strict environmental policies are restricting the mining industry growth at a wider scale.



### SCENARIO 3

Immigrants are an asset for both the Barents Region and companies – but green policies are the reason for big international investments



#### OMAN

*An ordinary citizen of the scenario*

Oman, 35, lives in Tromsø with her family. He moved to Norway in 2025 and located to the region in 2028 due to generous tax incentives and better employment opportunities.

Works for the local wild food production company and is responsible for onboarding the new employees from various cultures. Sees especially important to familiarize the newcomers with Swedish nature and forests as they provide gateway for the Norwegian mindset.

Travels frequently fishing to different fishing spots in the area with the company's autonomous electric vehicle. Enjoys much more free time than his parents due to 4-day workweek. Oman still remembers the scorching heat waves from his childhood and welcomes the ever-rainier winters of Barents regions.

Is a volunteer in a union helping refugees to settle into Norway and Barents region. Unions and local associations enjoy support from local governments and play important role in local economies that are more dependent on refugees and immigrants forming more all the time larger proportion of labour.



#### WILDBER

*A typical company of the scenario*

Highly specialized food company producing organic clean Scandinavian food products operating in Sweden and exporting most products abroad. High technology solutions are used where applicable but manual labor is still used extensively and enhanced with technological improvements such as personal drones and augmented reality.

Due to rise in temperature, growing season has expanded and company found it profitable to source forest products (mushrooms, berries) from Barents region. Efficient transport solutions and zero red tap related to border crossing enable sourcing of ingredients across borders.

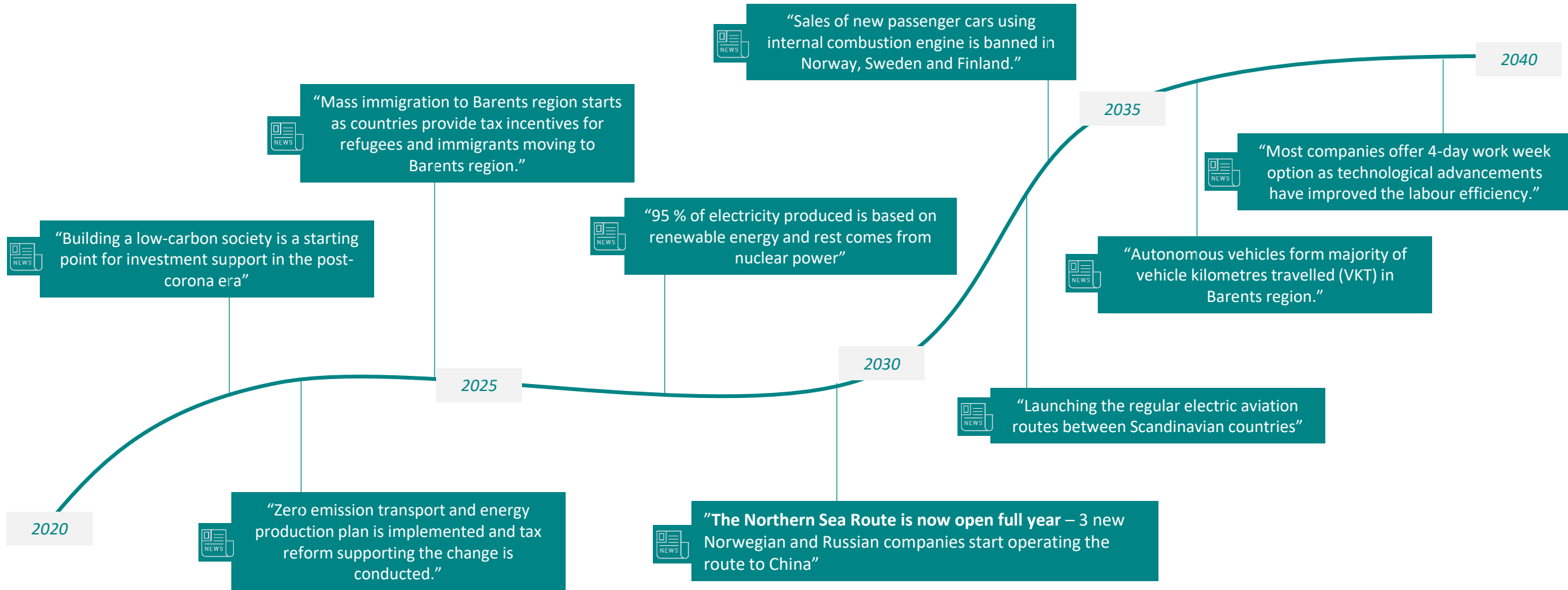
Recently the situation has changed for worse due to the spreading of new insects from a logistics container damaging forests and raw materials. These are combatted with experimental drone swarms spreading micro dosages of pesticides.

High value products are imported to Europe with e-aviation and lower value products with rail Baltica. China is also one of the largest importing market thanks to Chinas "Belt and Road Initiative" Developed high-class ITS systems making production and logistics smooth and efficient. Happy about the business-friendly environment in the Barents region where for example agricultural drones and 5G technologies are in effective use.



### SCENARIO 3

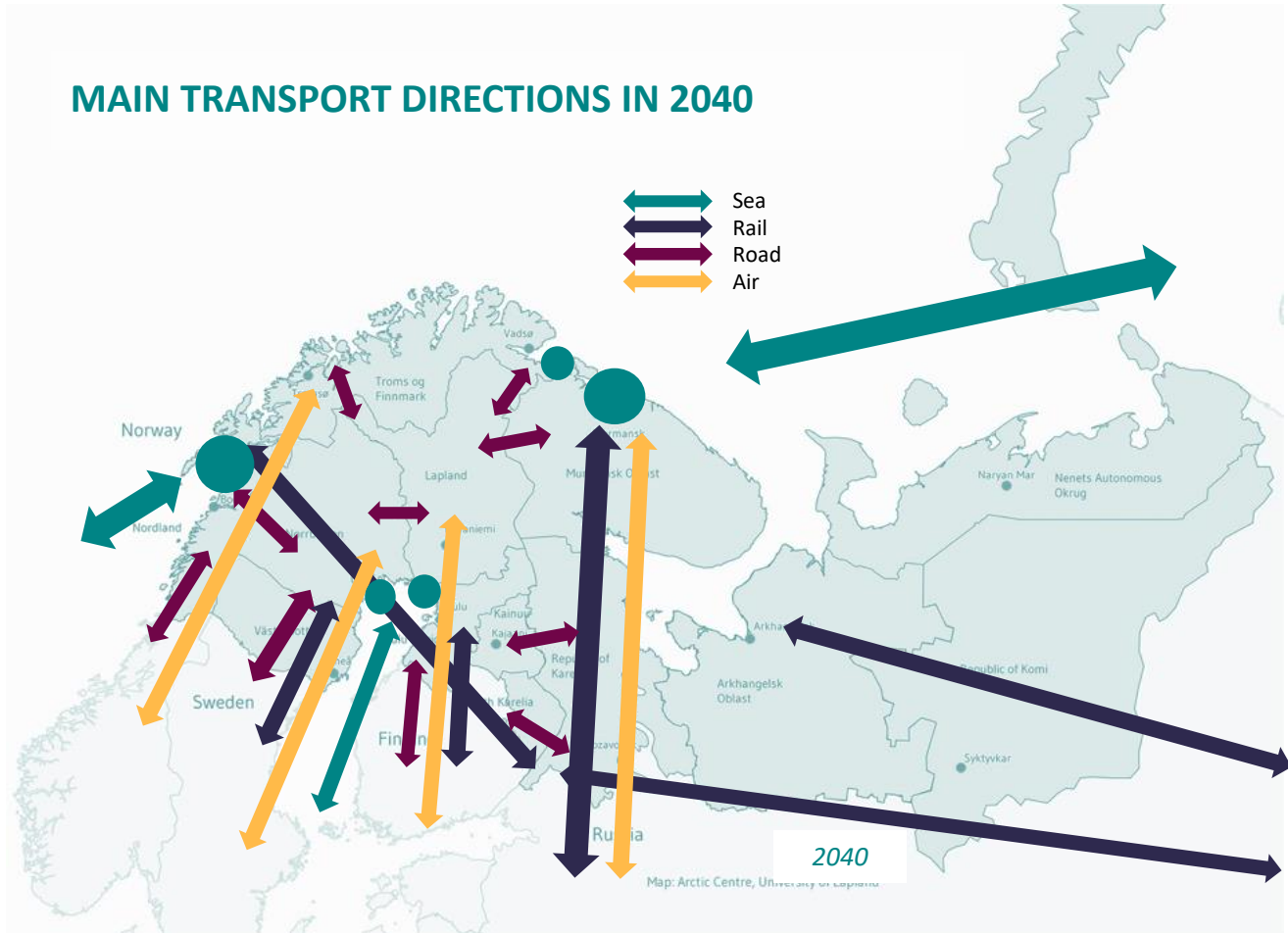
## Key events in the timespan in the path to the scenario



### SCENARIO 3

Companies are highly interested in using the Barents Region as a transit location due to green logistics principles and high standards

#### MAIN TRANSPORT DIRECTIONS IN 2040



#### SUMMARY

*The role of the Barents Region in the global transport and logistics market according to the scenario*

As a result, the transportation vehicles used in the region are mainly electric and low-carbon, which has attracted companies to transport their goods using the hubs in the area. Logistics is a large business area in the region.

However, there are industries whose transportation flows will decrease due to balance shift in the overall economy caused by stricter approach to environmental issues. No new major mineral mines are opened after 2030s and the significance of mining industry in the area has decreased. As tourism will focus more to extreme tourism and niche markets, the overall level of tourists visiting the area will decrease as well.

Thanks to the investments in green transportation, the companies have understood the benefits of the geographical location of the Barents Region and see it as an attractive transit destination. Most goods transported in the logistic chains are only bypassing the region and moving between China and Western hubs. Also, as the result of the Belt and Road Initiative by China, the rail traffic to China increases.

As big investments in electric vehicles has boosted the development and use of electric airplanes, the air traffic increases significantly in the area. Autonomous and electric vehicles are also widely used in cross-border logistics chains, especially between the Nordic countries.

LEADING ZERO-CARBON TRANSPORTATION HUB



ZERO-CARBON MOBILITY RULES



BOOMING LOGISTICS INDUSTRY



IMMIGRATION AS AN ASSET



ACTIVE COLLABORATION



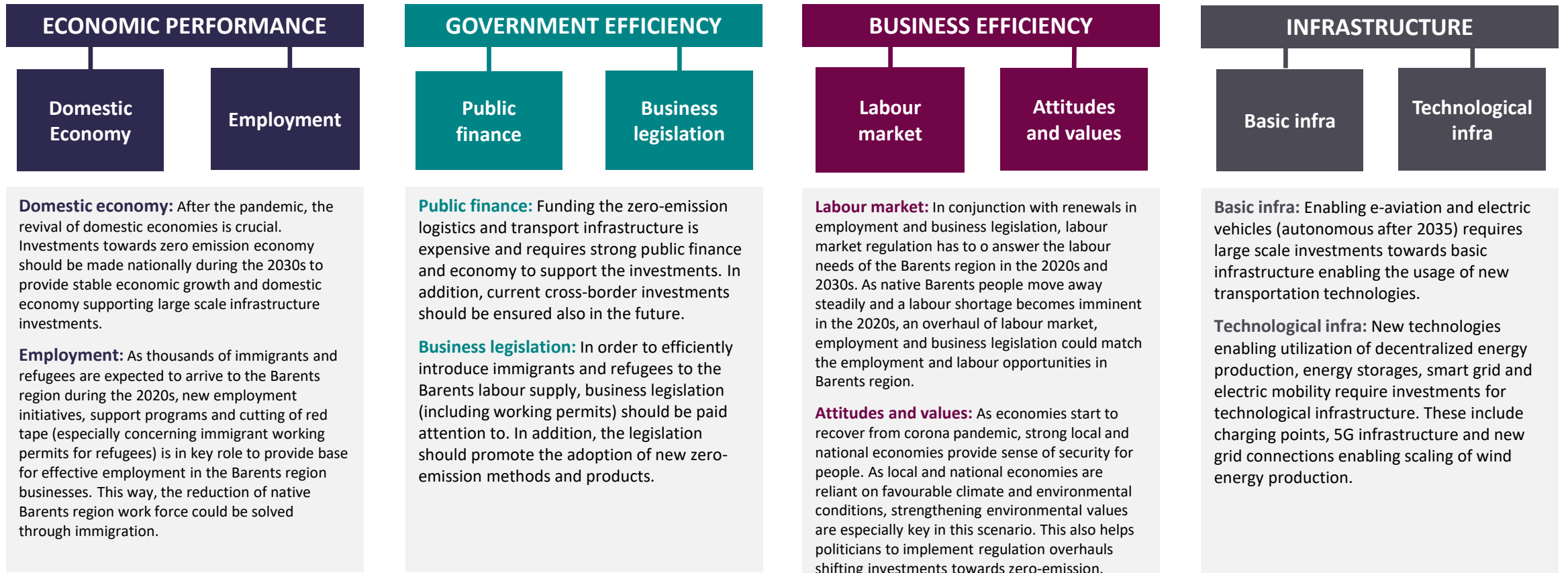
EXPERIENCES FROM THE NATURE



## BARENTS REGION COMPETITIVENES – SCENARIO 3

Unlocking full potential of scenario three requires infrastructure investments and better usage of immigrants and refugees who need to enter labour market quickly

Most important factors of competitiveness in this scenario:



## 5.5 Summary



# FUTURES TABLE OF THE SCENARIOS

The three scenarios are based on different future states of the key variables in the area



	Post-corona reaction	Environment	Demographic development	Accessibility and infrastructure	Barents regional collaboration	The role of public sector
<b>SCENARIO 1</b>	The focus has been on economic recovery without considering the long-term impact of the investments made. Also, the biggest efforts are directed to areas that were most growing already before the crisis, which has left the rural areas out of focus. On the other hand, as protectionism has grown in the EU-level and companies have invested highly to relocating their production and raw material production closer, this has enabled the grown interest towards the resources located in the Barents Region.	The effects of climate change are challenging the companies using the natural resources. Big rainfalls tease the mines, new species damage forests and the snow-proof areas are moving higher north. There has been no systematic precaution to the effects of climate change in addition to the prevailing over-optimism regarding the situation to resolve itself. The result is the realization of the negative causes of the climate change and the Barents region being left behind in development.	The population has decreased significantly. In some key areas companies have taken greater responsibility for attracting new residents, which has helped the situation somewhat, yet not entirely. Most companies find the lack of suitable employees as a barrier to invest to the area. Due to global warming, big refugee masses became frequent in the 2030s, which caused opposition among the locals in the region.	Due to protectionist movements, EU has lost a big part of its funding and possibilities to invest in the regional development. The main transport routes have been improved by company investments to ensure required road and rail transportation to the big hubs in Europe from the Scandinavian part of the Barents Region. Many areas have, however, been left out from the infrastructural development. The basic infra needs improvement and maintenance, there are no individuals living close by - and this has created a situation that is too risky and investment heavy for it to be profitable. There have been only some investments to the data communication infrastructure funded mainly by companies, but that has benefitted only a few areas. The Northeast Passage as a route has not been realized as expected, as there is no international will to invest and use the Arctic route due to risks and protectionist attitudes. Instead, the goods between Europe and Asia are transported through the big European hubs.	There is protectionism in power, the governments in the area take care of their own issues and are not interested in collaboration in the Barents region - it is seen as a memory from the past. Also, as EU funding decreased significantly, there are less possibilities to support the regional development and collaboration. However, companies cooperate within industries despite land borders, which supports the development of the region's infrastructure.	The public sector has been drastically cut and responsibilities transferred to the provinces. Above all, the Barents region is seen through the interests of the businesses - yet the vast resources are recognized by the governments. The national investments have been put to the development of urban areas and businesses having the biggest future impact, and as a result big areas in the Barents region are almost empty.
<b>SCENARIO 2</b>	Over-conscious attitude spread among the people, as the corona and other virus outbreaks became frequent pandemics during the 2020s and 2030s. Individuals realized the possibilities of remote working and from early on big investments were directed to developing telecommunications and data infrastructure. This made it possible not only for white-collar workers to buy new summer houses and use them also outside of the summer season for working, but to create societies functioning completely online. However, the reaction to corona virus mainly took place at the individual level and not at the level of countries, keeping close global collaboration in agenda.	Various measures were taken to prevent climate change, but this was not enough. The average temperature has risen over two degrees, which has had multiple effects to the operating environment. In the Barents region, the effects include frequent fluctuations in weather conditions, yearly temperature rising to a level where snow is not guaranteed every year, summers being relatively hot, and the increased need for rescue services for events such as avalanches, fires and maritime accidents. The Northern Sea is also open all year long.	The online and accessible society enables working remotely and many people have found it suitable to live in suburban surroundings. In larger countries, drone-based logistic chains serve people living in the rural areas, as the consumer base is so high, but this isn't the case in the Barents region. Knowledge workers are dual-residents in bigger cities and smaller summer cottages that are typical to be owned. Data centers and maintenance work still require some physical travelling, which pushes people living close by. Overall, the population has decreased in the area, yet not so drastically as was thought due to more free working arrangements. Inside the Barents region, however, people are mainly living in the suburban areas.	Data network investments have significantly improved accessibility, yet physical infrastructure development has concentrated in the most growing regions close to data centers. Due to overall decrease in transportations - people are not interested in travelling in the fear of epidemics in large tourism attractions and cities - the social and virtual accessibility has grown in significance. The Northeast Passage is in Russia's and China's bilateral use, but apart from that mainly not used. Instead, the Northern Data Cable has brought data traffic to the Barents region and enabled multiple jobs due to the data centers located in the area.	Uncertainty has remained high and the situation is changing rapidly. There is still collaboration in the Barents region level, but the amount of activities depends on the country and person chairing or whether there is a new pandemic or a cyber attack taking place and complicating the collaboration.	Strong regional policy and investment to keep the whole area populated - tax breaks and other benefits will keep the Barents region alive. Public sector services are mainly offered online from healthcare services to education due to growing uncertainty over possible future health pandemics as well as a very developed data traffic infrastructure to allow it. Public sector is a big employer, and compared to other European regions, in lead when it comes to being digitally present in the residents' everyday lives. The online society has also attracted various cyber attacks to both businesses and the public sector. These attacks change form constantly and has also changed the role of government to protect its people from such outbreaks.
<b>SCENARIO 3</b>	The focus of the countries was in building environmentally sustainable growth in order to mitigate both the economical stagnation and the climate crisis approaching. Major investments in low-carbon transport infrastructure, wind power and new technologies were made as tools to enable economic recovery. As a result, the synergies between renewable energy, smart grids and e-transport were realized in the area.	Thanks to global efforts, the global warming has been kept in 1,5 degrees. This means, that the impacts have been only minor - yet still exist. Environmental issues are in the center of the society's priorities both locally and globally, as the warming still hasn't ended completely.	The number of immigrants in the region has increased significantly in response to the growing need for work aged residents. People with origins in the Barents region are not as big majority as they used to be, but nobody sees this as a problem. Most people live in the growth centers of the area - the regional capitals and areas close to the logistics hubs. Due to good data infrastructure, most of knowledge-based work is concentrated in the larger cities outside of the Barents region.	Accessibility has improved, especially between the growth centers in the region. Infrastructure projects (incl. autonomous vehicles and electric airplanes) focused on main roads and cities large enough to support airports. Also, as green transportation has become the key competitive edge for the area in the logistics market, a snowball effect has been created. Especially the border-crossing infrastructure has increased and the logistics hubs area smoothly operating in collaboration. As the Barents Region is a well-established green logistics hub, also the cost-cutting benefits of the Northern Sea Route have been noticed. Thanks to the big EU Green Deal Investments in the 2020's, a solid foundation was formed to the future development. In addition to the Sea Route, also the Chinese Belt and Road initiative has been built and is in active use. Together with these, also building the TEN-T network to Finland has been a profitable investment. Existing road infrastructure is being strongly developed to support low-carbon transport and logistics while investing in rail infrastructure between countries by projects funded by both the EU and China.	Active cooperation is characteristic for the region. This means government-level support for the regions - both in the Nordic countries as well as in Russia. Common goal-setting and shared challenges brought the areas together late 2020s, which has lasted. Protecting the fragile environment yet supporting the growing businesses in the area requires close collaboration and shared decision-making from all countries.	Public sector has a strong role in the development of the Barents region. Attracting and integrating immigrants successfully has been one of the key activities of the public sector that has benefitted the entire area.

## TO COMPLETE THE SCENARIO WORK

A joint vision for the Barents Region could be drawn for the year 2040 based on the scenarios

### MAIN TRENDS THAT SUPPORT THE ACTUALIZATION

Energy transformation

Positive future outlooks for mentioned industries

Digitalization, esp. post-COVID

#### SCENARIO 1 Protective and company-driven Barents region

*Aspects found worth pursuing:*

- Strong role for companies in the development work
- Utilizing the comparative advantage businesses of Barents

#### SCENARIO 2 Security-conscious online society

*Aspects found worth pursuing:*

- Fighting population decline through remote working possibilities
- Utilizing the potential of online services

#### SCENARIO 3 Leading zero-carbon transportation hub

*Aspects found worth pursuing:*

- Maintaining the region's competitive advantages by preventing climate change, creating basis for experience tourism
- Utilizing controlled immigration to support the workforce challenges of local companies

"SCENARIO 4" – THE VISION

#### VISION OF BARENTS

By 2040, Barents has become an area of strong key businesses such as bioforestry, blue economy, sustainable mining industry, technology sector and tourism. The key industries have a strong role in developing the area. This takes place e.g. through offering services and an active role in the coming up of new ideas and pilots in e.g. infrastructure development. Cross-border co-operation has further strengthened supporting businesses.

The comparative advantage of Barents lies mostly in its location which provides many natural resources, but also the integrity of this nature. A natural balance between these have been found, which also provide a basis for the experience-based tourism. At the same time, this has required significant efforts to prevent climate change as the competitiveness lies mostly in keeping the current conditions "alive" - e.g. fresh air and snow safety. A natural part of the equilibria is renewable energy such as off-shore wind power.

Transportation requires businesses, which require employees. Therefore, marketing and increasing the attractiveness of Barents has been a focus area of development. This has been done both by increasing controlled immigration and possibilities to implement online work. Education institutions provide good foundation for skilled employees.

#### IMPLICATIONS FOR TRANSPORTATION

Transportation planning of the 2040s should be done with the main growing sectors in mind and involved in the planning process. The Barents area transportation-requiring main businesses are likely to remain as they are today even though the businesses themselves modify – e.g. forestry is increasingly about packaging, and fishing about cosmetics and medicine. The completely upcoming businesses of the future are more likely to be knowledge than physical asset based.

Due to long distances, road transportation is likely to remain the most important mode of transportation. These include investments to improve cross-border traffic and ITS management systems. As ITS regardless becomes a standard, data traffic needs to function well.

The remaining and strengthening role of tourism also means, that aviation related transportation routes are going to remain significant in importance. However, investments in the infrastructure are more likely to become relevant after 2030s as the corona virus pandemic is likely to keep tourism flows lower than usual for the next few years.

On the other hand, if climate change mitigation is more successful, it is going to slow down the full adoption of Northern Sea Route. Therefore, this is not viewed as a focus area moving towards 2040s.

#### FACTORS OF COMPETITIVENESS TO FOSTER

International trade	International investment	Environment
Management practices	Labour market and education	Attitudes and values

**In international trade and investment, Barents competitiveness is good also in the future**

Natural resources of the area are in increasingly high demand. International investors find Nordic countries easy operating environments. Sustainability of production is increasingly important and to be highlighted in contrast to price.

**In environment, Barents type regions are more and more interesting to tourists, but risks exist**

Locations close to nature, fresh air and unique phenomena are attract people interested in experiences and provide change to urbanized cities. However, climate change with its reducing snow safety poses significant challenges to Barents competitiveness in the future.

**In management practices, labour market and attitudes a lot can still be achieved**

For all businesses and, hence, transportation, the crucial thing is to find the right employees. In this competitiveness factor, Barents area is not at its best. The changing attitudes and management practices towards remote work make a good contribution, but marketing of Barents to change old attitudes is needed.

### MAIN TRENDS THAT THREATEN THE ACTUALIZATION

Climate change

Urbanization

Protectionism

Steering Barents as "one region"



## Some sources

## SOME OF THE SOURCES USED IN THE ANALYSIS

- Statistics Sweden (2020)  
Russia Federal State Statistics Service (2020)  
Statistics Finland (2020)  
Statistics Norway (2020)  
Statista (2020)  
Eurostat (2019)  
OECD (2020)  
Barents Cooperation (2020), Barentsinfo.org (2020)  
Barents Observer (2020)  
World Bank (2018)  
Worldometer (2020)  
The Barents Region changes – How will Finland adapt? Publications of the Government's analysis, assessment and research activities (31/2017)  
AMAP: Adaptation Actions for the Changing Arctic (2017)  
Joint Barents Transport Plan (2019)  
Visit Finland, Rudolf -portal (2020)  
CEIC (2018)  
Fakta om svensk turims (2017)  
OEC (2017)  
IRENA: Renewable energy prospects for the Russian Federation (2017)  
IEA (2019)  
MDPI: Circular economy in Russia - Drivers and barriers for waste management development (2019)  
World bank (2020)  
Nordic Council of Ministers: Analysis of Nordic regulatory framework and its effect on waste prevention and recycling in the region (2019)  
Geohistory Today (2018)  
Materialstoday.com (2019)  
Kauppalehti 19.3.  
Gartner (2019)  
Automotive News (2020)  
EC (2018)  
DNA (2019)
- Hertzberg (2019)  
Government offices of Sweden (2019)  
Center for sustainable energy studies (2018)  
Yu Trofimenko et al. (2018)  
Enerdata (2019)  
BNEF (2020)  
SLU (2016). Framtidsberättelser från lantbruket år 2030  
Lansstyrelsen (2017). Klimatförändringars inverkan på Sveriges livsmedelsproduktion  
Jordbruksverket (2019). Norrbotten satsar på ökad kunskap om hållbar mat bland barn och unga  
Regjeringen i Norge. (2019). Vil produsere mer mat i Nord-Norge.  
Nofima (2019). Status, verdi og utfordringer for matproduksjon i Arktisk Norge.  
Nibio (2018). Klimaendringenes påvirkning på landbruket i Norge innenfor ulike klimasoner.  
Työ- ja elinkeinoministeriön julkaisuja 2019:57. Toimialaraportit – Kaivosteollisuus.  
Arvopaperi (2019). Onko tarina Suomesta kaivoskeitaana kestävä, Kaivosteollisuus ry:n toiminnanjohtaja? – "Tämä on terveellinen muistutus".  
Mineralstrategi for Nord-Norge 2019  
SveMin (2020) - Statistik.  
Regional strategi för innovativ och hållbar utveckling av mineralsektorn.  
Sveriges geologiska undersökning (2020).  
Innovation Norge (2020). Muligheter for norske bedrifter i Russlands gruveindustri.  
NRK (2019). Vil ha mer gruvedrift i Norge – må akseptere inngrep i naturen.  
Harde fakta om mineralnæringen – Mineralstatistikk 2018.  
Luke studies on Blue Economy.  
Nofima studies on Blue Economy.  
IFC: Waste in Russia - Garbage of valuable resource? (2014)  
Luonnonvara- ja biotalouden tutkimus 47/2015  
Luonnonvara- ja biotalouden tutkimus 12/2018  
Maaseudun tulevaisuus (2019): Arktisten alueiden maatalous painii yhteisten haasteiden kanssa  
OECD–FAO Agricultural Outlook 2019–2028;  
McKinsey (2018 & 2019)  
European Travel Commission (2020)  
Total Logistics (2019)  
businessleader.co.uk (2019)  
Moscow times (2019)  
Arctic Business Forum Yearbook (2019)



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